INTERNATIONAL DOCTORAL STUDENTS: RELATIONSHIPS BETWEEN ENGAGEMENT IN ACADEMIC-SOCIAL ACTIVITIES AND SELF-PERCEIVED ACADEMIC GAINS

BY

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ABSTRACT

The purpose of this study was to examine the extent to which international doctoral students in six research universities engage in academic and social activities and how this engagement is related to their academic gains as measured by the international students' survey responses. This study employed a quantitative research design to investigate the relationships between student engagement and six academic gains during doctoral education: (a) acquisition of academic knowledge and skills, (b) writing clearly and effectively, (c) presenting research, (d) publishing research, (e) career preparation, and (f) satisfaction with academic gains. Overall satisfaction from the academic gains of participants was low. Two types of student engagement – the supportive campus environment and participation in co-curricular activities – were percieved as key contributors to international doctoral students' satisfaction with their academic gains. The active and collaborative learning, supportive campus environment, usage of technology, and programmatic emphasis on studying and socializing were significantly related to the students' acquisition of academic knowledge and skills in their doctoral area . The student participation in co-curricular activities, supportive campus environment, and time that they spent on academic work had a significant relationship with presenting and publishing research among the international doctoral students. Student-faculty interaction and a supportive campus environment were found to have a significant relationship with the career preparation of international students in doctoral programs. The financial assistance was found to be a significant contributor to the overall satisfaction of international students. In conclusion, this research indicated a definite relationship between international students' academic and social engagement and their academic achievement in doctoral study.

DEDICATION

To my father Rahmatjon Akobirov, my mother Muzayam Samadova and my husband Viral Kansara.

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CHAPTER ONE

INTRODUCTION

In higher education institutions in the United States, graduate students make up a large part of the student population, totaling more than 2.2 million students in 2006 with a predicted enrollment of 2.6 million by 2017 (Gardner, 2009). Doctoral students represent approximately 18% of the total graduate student population (Gardner, 2009). The past decade has seen increasing research on higher education issues related to the doctoral student experience (Gardner, 2009). One of these issues is doctoral student attrition, which often results in negative consequences, such as the waste of university human and financial resources that are unrecoverable (Willis & Carmichael, 2011). Other negative impacts of student attrition include the social and emotional costs that occur when students leave a doctoral program without getting their degree; this can have a devastating effect on that student's life (Golde, 2005). Only 50% of the students who enter doctoral education complete their degree (Gardner, 2009). The reasons for attrition can vary from inadequate student-faculty relationships, dissatisfaction with the program or department to the lack of financial support and feelings of psychological and cognitive inadequacy among doctoral students (Ampaw, 2010; Gardner, 2009). However, there are other possible reasons for attrition other than institutionally imposed ones when doctoral students' academic, career or personal goals change and the students decide to leave the program (Willis & Carmichael, 2011). Doctoral student attrition can happen at any stage of doctoral education (Willis & Carmichael, 2011).

Several studies reveal how doctoral students experience academic, social, and psychological barriers and what coping strategies they use to overcome these barriers (Golde,

1999; Harman, 2003; Mehra & Bishop, 2007; Wei, 2001). Those students who persist year-to-year, have high grade point averages, and complete their doctoral degree are considered successful students (Gardner, 2009). In order to persist in their doctoral program and complete the doctoral degree, the students are expected to meet certain academic requirements of the doctoral education such as mastering the coursework, gaining academic knowledge in their field, acquiring research skills, and writing their doctoral dissertation (Gardner, 2009; Lovitts, 2008; Nerad, 2004). Besides meeting the academic requirements of the doctoral programs, the students have their own expectations such as obtaining the knowledge and skills that prepare them for their professional career after graduation (Golde & Dore, 2004).

International students comprise about 110,000 of the students enrolled in doctoral programs in the United States (Open Doors report, 2009). In the United States, international students are defined as students who are not United States citizens or permanent residents of the United States. International students usually need an F1 or J1 visa to study in the United States. Research classifies international students as "unique students" because they speak different languages and come from different educational systems (Heng-Yu Ku et al., 2008). The universities in the United States award more Ph.D. degrees than the universities in any other country of the world (Bound et al., 2009).

Recruiting and retaining international students provides numerous benefits to the United States as they may be effective ambassadors who express favorable attitudes toward the United States upon return to their home countries if they have positive experiences during their graduate experience (Heng-Yu Ku et al., 2008). For example, every year hundreds of international students gain admission to U.S. universities through exchange programs such as Fulbright Graduate Scholarship Program, Edmund S. Muskie Graduate Fellowship Program, and the

Hubert H. Humphrey Fellowship Program and return to their home countries after completion of their degrees. They are expected to utilize the knowledge and experience gained in the United States in contributing to the development and prosperity of their home countries. The U.S. universities benefit from hosting students from the exchange programs because selection for the exchange programs is highly competitive for the students and consequently, the United States universities will have international students who are top achievers in their home countries and who will be fully funded by the exchange programs. While the United States benefits from the increased competition that international students bring to doctoral programs, a side benefit also occurs after graduation: about 50% of the international doctoral students remain in the United States after completion of the doctoral degree (Nerad, 2004).

Another benefit of recruiting international students is building long-term connections between universities and alumni who can collaborate in research with organizations overseas (Heng-Yu Ku et al., 2008). These collaborations can make a bridge that will connect the United States universities to the universities in other countries and serve for the purpose of developing research, educational, and social relationships among students, professors, and researchers.

The large population of international students in doctoral programs in the United States universities can create a set of diverse academic and social challenges for these graduate schools (Bound et al., 2009; Shen & Herr, 2004). International students leave their homelands with many career dreams and expectations in mind (Wang, 2008). They have high needs for academic achievement because they are often the top achievers in their home countries (Arthur, 2004). Therefore, the threat of returning home without getting their degree and facing the embarrassment of self, family, or sponsors, coupled with responsibilities for financial resources, creates immense pressures for international students (Heggins & Jackson, 2003; Tseng &

Newton, 2002; Wan, 2001).

During their study, international doctoral students struggle to achieve their academic goals, gain knowledge, and develop academic skills as many of them face difficulty transitioning to the United States college environment (Moffett, 2006; Poyrazli & Grahame, 2007). Factors such as English language proficiency, variations in learning and study strategies, gender, personality differences, country of origin, and general cultural differences have an influence on international graduate students' adjustment to their university (Arthur, 2004; Dee & Henkin, 1999; Heggins & Jackson, 2003; Lin & Yi, 1997; Luzzo, Henao, & Wilson, 1996; Parr, Bradley, & Bingi, 1992; Poyrazli & Grahame, 2007; Senyshyn, Warford, & Zhan, 2000; Stoynoff, 1997; Tomich, McWhirter, & King, 2000; Tseng & Newton, 2002; Walker, 2001; Wan, 2001; Weicheng, 2003). These factors, which the literature calls "difficulties" (Wang, 2009), may influence international doctoral students' academic achievement and satisfaction with their doctoral programs. While academic achievement and satisfaction are considered the causes for doctoral student attrition by many researchers (Le & Gardner, 2010; Willis & Carmichael, 2011), very little research exists on academic achievement and satisfaction among international doctoral students.

In order to remain as a host university for the exchange programs, U. S. universities are required to provide help and support for the exchange students during their study in graduate programs. Admitting international students to academic programs puts several responsibilities on the universities. One of the responsibilities is to care about whether or not the students fulfill their program requirements, achieve their academic goals, and complete their doctoral programs. Literature shows that international students have deeper concerns regarding achieving their academic goals than domestic students do (Li, Fox & Almarza, 2007; Mehra & Bishop, 2007;

Ramsay, 1999). A number of concerns related to the academic gains of international doctoral students remain unaddressed (Arthur, 2004; Moffett, 2006; Poyrazli, 2002).

Earlier research has shown that academic gains are greatly influenced by students' engagement in the academic and social activities of their institution (Kuh, 2001; Pascarella & Terenzini, 1998; Zhao, 2005). The concept of academic achievement itself is defined in many various ways by the researchers, such as the grade point average (Foster, 1965), development of critical thinking abilities (Ramsay et al., 1999), test scores (Collier, 1992), general education, writing/speaking/analyzing skills, solving quantitative problems, computer skills and communication skills (Knight, 2009; Zhao et al., 2005), and personal/social gains, job-related skills, and student satisfaction (Zhao et al., 2005). While academic achievement is mostly defined by measuring grade point average by many researchers, this study will not measure GPA as the variable for academic achievement because there is not a significant variation in GPA at the doctoral level; most of the international doctoral students maintain high GPAs during their studies (Poyrazli, 2006).

The focus of this research is to study the perceived academic gains of the international students during their doctoral study as defined by Gardner (2009). The academic gains for doctoral students are acquisition of academic knowledge in their field of study, development of research skills, and preparation for the future career. This study also examines the extent to which international doctoral students engage in academic and social activities and to find out if student engagement has a significant relationship to perceived academic gains among international doctoral students in six research universities.

Statement of the Problem

In her media interview with *The Chronicle of Higher Education* (December, 2006), Debra W. Stewart, the president of the Council of Graduate Schools, discussed the growing population of international students in doctoral programs in U.S. higher education institutions. According to Stewart, U.S. universities should prepare themselves to remain competitive, as "it would be a huge mistake to think that this supply [of international doctoral students] will last forever" (Smallwood, 2006). Recruitment and retention of international graduate students is in the best interest of universities. However, as Bain et al. (2006) state, the position of the United States as the leading host country for international students may not remain, because China and India, where the largest number of international students come from, are strengthening the quality of their graduate programs and turning them into world-class institutions in research and innovation. Thus, these countries are encouraging their students to study in their home country and reduce the outflow of money and talent that occurs when their students study abroad (Bain et al., 2006).

In recent years, doctoral education in the United States has received criticism regarding the high number of students who do not complete their doctoral programs and leave without getting their degree (Nerad, 2004). However, there is still not enough research on addressing the doctoral student experience in the United States. The research on international doctoral students is limited as well. The population of international doctoral students is a large piece of the changing doctoral student demographic in the United States (Gardner, 2009), and a greater understanding of this experience will assist with recruitment and retention of this graduate student population.

In order to study international students' academic gains during their doctoral education in

the United States, factors that appear to be related to the students' achievement of their academic goals must be studied. Academic achievement or academic gains, as Gardner defines (2009), can be closely related to student engagement in academic activities (Kuh, 2001) and social activities (Gardner, 2005). But there is a lack of research about the factors related to the academic gains of international doctoral students particularly. Higher education institutions in the United States are found to be struggling to identify programs and services that assist international students in achieving their academic goals (Ullah, 2007).

Gardner (2009) describes academic gains for doctoral students based on three stages in doctoral programs. These stages are entry, integration, and candidacy stages. Passing through these stages, doctoral students face the challenges of successful completion of coursework, comprehensive exams, and dissertation (Gardner, 2009). While taking courses in their discipline, the students start developing academic skills in reading, writing, speaking, and analyzing the course materials. In this study, academic skills were examined by asking international doctoral students to rate their academic skills in their knowledge acquisition in their doctoral area of study, their critical and analytical thinking, effective learning on their own, and clear writing. Consequently, in the integration and candidacy stages of their doctoral programs, doctoral students develop research skills while taking candidacy exams and writing their dissertation. That is why the survey for this study asked international doctoral students to rate their academic gains in presenting research at conferences, seminars, and workshops. Also, they were asked to rate their academic achievement in publishing research in scholarly journals so that the study could better examine the development of research skills among international students in doctoral programs. In the integration and candidacy stages of their doctoral programs, the students also start seeking professional positions, preparing for professional roles, and making decisions in

career plans, which are the indicators of career preparation (Gardner, 2009). As this study focuses on doctoral students, I look at their academic gains as described by Gardner (2009): academic skills, research skills, career preparation, and academic satisfaction. The dissertation studied the self-perceived academic gains in these four areas separately.

A number of factors influence students' academic achievement in college, and one of these factors is engagement in educational and social activities among undergraduate students (Kuh, 2001). This study is built on the theory of student engagement. The theory of student engagement refers to the amount of time and effort students put into their studies and other activities, which lead to the experiences and educational outcomes that constitute student success (Kuh, 2001). Engagement emphasizes two elements, what the student does and what the institution does, pointing to activities on the part of the individual student and the institution which are related to desired outcomes of college (Wolf-Wendel et al., 2007). In this study, I look at these two elements because the departmental and institutional context, in which doctoral students are educated play a great role in students' education and development (Gardner, 2009). Consequently, the survey included a number of questions regarding institutional emphasis on engaging students in educational and social activities.

In support of the student engagement theories based on undergraduate students, a few researchers discussed graduate student engagement in their studies and surveys (CSU, 2007; Gardner & Barnes, 2007; Wisker, 2007). However, the population of international students was omitted in these studies. The aim of this study is, therefore, to examine the extent to which international doctoral students engage in academic and social activities and to find out if student engagement has a significant relationship to academic gains among international doctoral students in six research universities.

Purpose of the Study

The purpose of the study is to examine the extent to which international doctoral students engage in academic and social activities and how this student engagement is related to their academic gains as measured by the international students' survey responses. The study defines academic gains as the development of the following four skills:

a) Academic skills, such as acquiring knowledge in one's area of doctoral study, thinking critically and analytically, learning effectively on one's own, and writing clearly and effectively.
b) Research skills, such as presenting research at conferences, seminars and workshops, and publishing research in scholarly journals.
c) Career preparation, such as preparation for professional role, job search, and making decision in career plans.
d) Academic satisfaction with academic gains in the students' current institution.

In this study, student engagement is defined as participation in educationally purposeful activities (Kuh, 2001) and participation in social activities (Gardner, 2009). Educationally purposeful activities are as follows:

1. Doing academic work (studying, reading, writing, doing lab work, analyzing data, and other academic activities).
2. Asking questions in class or contributing to class discussions.
3. Working actively with other students on projects during class.
4. Working with classmates outside of class to prepare class assignments.
5. Using technology (blackboard, listserv, facebook) to discuss ideas from reading or

classes with others outside of class (peers, family members, etc.).

6. Discussing grades or assignments with a course instructor.
7. Discussing ideas from readings or classes with faculty members outside of class.
8. Talking about career plans with a faculty member or advisor.
9. Working with faculty member on activities other than coursework (committee, orientation, student life activities, etc.).
10. Working on a research project with a faculty member outside of course or program requirements.
11. Participating in co-curricular activities that are related to students' academic program (teaching/research assistantship, academic organizations, campus publications, etc.).

The students' participation in extra-curricular activities, such as attending clubs, organizations, and student associations that are not related to the academic purpose or academic requirement of the doctoral programs is considered social activities in this study. Many international students experience difficulties engaging in social and academic situations (Le & Gardner, 2010). It is important to study social engagement among international students because social engagement influences levels of academic and overall satisfaction among international students (Trice, 2004). This study investigated the research questions through a quantitative research design by administering the online survey to international doctoral students in six research universities.

Research questions

The following research questions were addressed in this study:

1. To what extent do international doctoral students in six research universities engage in academic and social activities during their study?
2. Is there a significant relationship between engagement in academic and social activities and academic achievement for international doctoral students?

Specific research questions were as follows:

1. How is engagement in academic and social activities related to the acquisition of academic knowledge and skills in the area of doctoral study among international doctoral students?
2. How is engagement in academic and social activities related to writing clearly and effectively among international doctoral students?
3. How is engagement in academic and social activities related to presenting a research at conferences, seminars, and workshops among international doctoral students?
4. How is engagement in academic and social activities related to publishing research in scholarly journals among international doctoral students?
5. How is engagement in academic and social activities related to career preparation (preparation for the professional role, job search, and decisions about career plans) among international doctoral students?
6. How is engagement in academic and social activities related to satisfaction with academic gains among international doctoral students?

Research Significance

This study adds to the research on student engagement by offering additional insights into international students' engagement and academic outcomes. As colleges continue to increase recruitment efforts to attract greater numbers of international students, it is important to better

understand these students' needs in order to foster their academic achievement and success (McCormack, 2007). The need for innovative programs and expanded research related to improving the graduate school experience of international students is significant as there are many benefits of having a strong international presence in the U.S. academic environment (Heng-Yu Ku et al., 2008). This research will help institutions identify whether or not international students are taking advantage of engagement activities and other learning opportunities that are available to them. Findings on what students are doing and whether outcome goals are being achieved will be useful to inform policy decisions that focus on international doctoral students' academic and social needs. Faculty and staff will also find the results useful as they interact with international students and as they establish pedagogical approaches and structured learning experiences that can help international students persist in their doctoral programs and complete their degree.

This study is expected to fill a gap in the research on international students and their academic achievement by examining its relationship with engagement in academic and social activities. It can also contribute to the theory of student engagement by applying it to the population of international doctoral students.

An educational institution should honestly answer questions regarding its own qualifications and responsibilities in accepting international students (Putman, 1961). Although this statement was made almost 50 years ago, researchers on higher education issues are still calling for the focus and attention from the universities in admitting international students into their academic programs (Poyrazli, 2006; Smallwood, 2006). Studying in the United States is more stressful for international students than studying in their home countries due to the different teaching methods, fast-paced class sessions, two-way interaction with professors in the

classroom, more student participation in the classroom, more classroom and group activities, more reading and writing assignments, more presentation and speech requirements, and more after class studying (Zhai, 2002). In addition to academic pressures, international students have the stress of living in an unfamiliar culture and adjusting to life in the United States, including difficulty with English language proficiency, insufficient financial resources, social integration, homesickness, and role conflicts. Therefore, helping international students successfully adjust to U.S. culture and higher education should not be ignored (Zhai, 2002).

Amy Gutmann, the President of the University of Pennsylvania, pointed out that the U.S. government and higher education institutions will definitely benefit from international students who contribute to the prosperity of the country with their education and talent. And if U.S.universities want to maintain the status of being first in the world in hosting international students, they must meet the needs of doctoral students who represent the new majority of international students (Moffett, 2006).

One of the reasons for selecting the population of international doctoral students for this study is that doctoral students represent the new majority of international students in U.S.universities (Moffett, 2006). When international students are in doctoral programs, institutions face additional challenges to meet their needs as doctoral students expect to achieve their personal goals and ambitions that they at least hope to result in positive outcomes (Elsey, 2007). Financial problems, change of dissertation research design, and conflicts with faculty are among the frustrating problems that international doctoral students face during their studies (Ang & Liamputtong, 2008; Heng-Yu Ku et al., 2008; Lee, 2007). All doctoral students need regular encouragement and personal support because it is not only an academic and intellectual experience, but it is also an intensely personal journey, largely taken alone (Elsey, 2007). It is

important to study international doctoral students as a separate group so that the knowledge learned from research is available to help counselors, professors, advisors, and the international student offices to better understand and help this population (Poyrazli, 2002). Learning more about international students in doctoral programs would significantly add to the current research on the international student population and will help the universities to better understand the international doctoral students' interests and needs. The universities will also be able to help international students in their transition to the U.S. educational system, achieve their academic goals, and complete their doctoral degree.

This study can be of critical importance in terms of helping the institutions refine and develop institutional support structures, policies, and programs so that they adequately address the needs of international doctoral students. The results of the survey will be shared with six research universities – Iowa State University (ISU), Kansas State University (K-State), North Dakota State University (NDSU), University of Kansas (KU), University of Nebraska-Lincoln (UNL), and the University of Missouri-Kansas City (UMKC) – that participated in the study. This study can improve the quality of doctoral programs in order to help students to achieve their academic goals and become scholars in their academic field. The importance of engagement in academic and social activities shows the necessity of doing research in order to learn their relationship with the academic outcomes for international doctoral students. The findings of this research can be a helpful source for the institutions as they examine their preparedness to accommodate international doctoral students' needs and problems in doctoral programs and campus communities.

Chapter 1 has presented the introduction, statement of the problem, purpose, and significance of the study and research questions. In order to answer the research questions, I will

first review the literature on the doctoral education in U.S. higher education institutions, the characteristics of the international doctoral students, the challenges they face during their study in doctoral programs in the United States, and the student engagement theories in Chapter 2. The issues that will be explored related to the international doctoral students are their academic engagement, social engagement, and self-perceived academic gains. Next, I will discuss the definition of variables, the survey construction, the process by which data was collected, statistical analysis to examine the relationship between student engagement and academic achievement, and the validity and reliability of the study in Chapter 3. The results of analysis and findings to emerge from the study are reported in Chapter 4. Chapter 5 contains a summary of the study and findings, conclusions drawn from the findings, a discussion, implications and limitations of the study and recommendations for the further study.

CHAPTER TWO

REVIEW OF LITERATURE

This chapter describes the published literature on doctoral education, the challenges and opportunities for international doctoral students in U.S. universities, the levels of international students' engagement in both academic and social activities and its impact on academic gains and achievements of international doctoral students in the U.S. universities. It also provides the literature review for the detailed description of three stages in doctoral education, doctoral student engagement in social activities, and five benchmarks of educational practices in the theory of student engagement by Kuh (2001).

Doctoral Education

The literature defines doctoral education as a foundation for an academic career as well as for developing research skills (Elsey, 2007). In their study on doctoral education, particularly PhD programs, Golde and Callagher (1999) define the PhD as a research degree, which is designed to prepare students to become scholars. That is why, in addition to the satisfactory completion of coursework, PhD students are also expected to develop a range of research skills (Gardner, 2009; Golde, 1999; Wisker et al., 2007). At the end of the PhD program, students are expected to have acquired the knowledge and skills expected of a scholar who has made an original contribution to the field and has attained the necessary expertise to do so (Golde & Gallagher, 1999). Gardner (2009), in her monograph on doctoral students' experience, introduces three stages of doctoral student experience as well as particular challenges that doctoral students face in these stages:

1. First Stage of Doctoral Education: Entry

In this stage, doctoral students face the multiple challenges of being new students, including applying to prospective programs and institution. During this stage, they visit campuses and interact with people in those prospective programs, move to the new location, and begin their coursework. They also begin balancing the demands of life and graduate school (Gardner, 2009). Meeting fellow students during the orientation for new students and connecting with the faculty and staff are considered to be sources of support for the doctoral students (Gardner, 2009).

2. Second Stage of Doctoral Education: Integration

In the second stage of doctoral education, students experience social and academic integration. They are expected to demonstrate competency and skills in coursework as well as in the examination process. During this stage, doctoral students make the transition from being a knowledge consumer to a knowledge producer (Gardner, 2009); hence, supportive relationships with both peers and faculty can be useful for the students as they form deeper bonds with these individuals who likewise understand this step (Gardner, 2009).

3. Third Stage of Doctoral Education: Candidacy

In the final stage of the doctoral education, students are challenged to conduct independent research for the dissertation and begin looking for professional positions. The literature considers conducting research to be one of the main roles of a doctoral student (Gardner, 2009; Heng-Yu Ku et al., 2008; Robins, 2008; Thune, 2009). Students need to learn skills regarding conducting research and publishing journal articles (Heng-Yu Ku et al., 2008). However, Gardner (2009) suggests there may be insufficient sources of information and lack of departmental help provided for doctoral students in developing their research skills. The

challenges in the third stage of doctoral education intensify as the support students had in the earlier two stages through close peer relationships in coursework and daily interaction with faculty may be lost because of the independent work during this stage (Gardner, 2009). The time when most of the students fail in their doctoral education is the third stage, when the students are in the process of conducting doctoral research (Lovitts, 2008).

The three stages described by Gardner (2009) are not unique to domestic doctoral students, but they are common to the international doctoral students experience also. International students face these challenges while still unfamiliar with the American education system, culture, and life. The term "still" is used because even those students who previously attended undergraduate or graduate school in the United States can have difficulties succeeding in their program (Bound et al., 2009; Mehra & Bishop, 2007; Wisker et al., 2007). A limited amount of literature has been published on international doctoral students. Within this limited data, the actual experiences of international doctoral students were not extensively discussed (Golde & Dore, 2001).

International Doctoral Students

This study focuses on international doctoral students in six research universities in the United States. International students are those who do not have either U.S. citizenship or permanent residency. They can have different types of visas such as an F1 or J1 for studying in higher education institutions in the United States. In 1954, the highest proportion of international students in the United States came from Asia; the absolute number of international students increased from 53,107 in 1960 to 336,990 in 1982 (Agarwal & Winkler, 1985). The article by Agarwal and Winkler (1985) describes the migration of foreign students to the United States and

the way this process has changed. Agarwal and Winkler analyze the determinants of foreign student flows and assess the quality of the existing data on foreign students in 1985. According to the Open Doors report (2010), the number of international students in U.S. colleges and universities increased by 3% to 690,923 during the 2009-2010 academic year. The Chinese student enrollment increased 30% to a total of about 128,000 students, which is more than 18% of the total international undergraduate and graduate student population. Students from India increased by 2% to a total of about 105,000 students; they represent 15% of all international students in the U.S. higher education institutions (Open Doors Report, 2010). Currently, international graduate students from 170 foreign countries are enrolled in masters and doctoral programs of American colleges and universities (Poyrazli, 2006). It is estimated that the number of international students in undergraduate and graduate programs will continue to increase to about eight million in 2025 (Eustace, 2007).

Challenges for International Students in United States Universities

Studying in the United States is not easy for international students. Among the various reasons, the most profound challenges they face are an adjustment to the U.S. education, cultural differences, and language challenges (Zhai, 2002). The inability to speak English fluently is a primary restraint that affects adjusting academically or becoming socially engaged in Untied States society (Poyrazli, 2002). As a result, international students have personal and social concerns, such as social isolation, loneliness, homesickness, irritability, and fatigue (Li, Fox, & Almarza, 2007). Heng-Yu Ku et al. (2008) notes that many people who go into a doctoral program of study have a difficult transition as they experience increased feelings of insecurity, high levels of stress and anxiety, and decreased self-esteem. Universities should not ignore the

challenges international students face, the problems they encounter, and the needs they have during studying in doctoral programs in the United States; the stress experienced by international students in graduate programs is substantial and real (Moffett, 2006).

According to Zhai (2002), studying in the United States is much more stressful for international students than it would be in their home country due to the different teaching methods, fast-paced class sessions, and two-way interaction with professors in the classroom. Zhai also noted that international students face increased student participation in the classroom, classroom and group activities, reading and writing assignments, presentation and speech requirements, and after class studying. As an example, Asian doctoral students are accustomed to being passive listeners in classes because speaking in class without being asked to is disrespectful in their culture (Moffett, 2006).This behavioral pattern may actually be similar to classroom cultures of many other Eurasian countries such as Russia, Ukraine, Uzbekistan, Tajikistan, and Georgia. Getting accustomed to the American style of classes where students are engaged in the class discussions can be challenging to international students. However, class instructors are not always aware of the diversity in their classroom or they may ignore the fact that international students come from different educational systems. While all American students are differ in the way they learn among themselves, it is still obvious that students from other countries are not used to the teaching methods and expected class participation in U.S. universities. This study does not offer to change the U.S. instructors' ways of operating their courses, but it does suggest that instructors in doctoral programs ought to think about possible approaches to help international students, at least in the initial stages of their doctoral study, so that they learn how to participate in class discussions.

Besides academic difficulties, international doctoral students may encounter the

challenge of social engagement, such as taking part in extra-curricular activities (participating in student associations, campus organizations, or sports), interacting with American students, and being active in the social life of campus. Engagement in extra-curricular activities helps international doctoral students better understand the university environment, plus it provides them with opportunities to explore social and cultural differences (Green & Kim, 2005). However, social engagement of international doctoral students is rarely discussed in literature. Engagement in social and academic interactions may also help international students to cope with their adjustment problems and successfully achieve their academic goals (Poyrazli, 2002). But the question whether international doctoral students actively engage in social activities or not, remains unanswered in the existing research on international students.

It is true that international doctoral students engage in extra-curricular activities at the beginning of their study in the United States because they participate in international student orientation, sign up for student organizations and associations, and socialize with their host families. But as the time passes, their active engagement diminishes and interactions with others become limited (Green & Kim, 2005). For example, the qualitative study by Moffett (2006) reveals that Asian PhD students are socially isolated from other students in their programs, but they welcome the opportunities of socializing in a group. For instance, Korean doctoral students have experienced unsuccessful attempts to make social relationships with American students and faculty (Green & Kim, 2005). International students are considered to be passive and not active by American students and faculty, and this stereotyping does not permit them to build relationships within their academic department (Green & Kim, 2005). Since Asian students now represent the majority of international students in U.S. higher education doctoral programs

(Moffett, 2006), the studies on international students discuss this particular group more than the students from other continents of the world.

Literature on international doctoral students also reveals that younger doctoral students are much more social and independent than older doctoral students (Moffett, 2006). Social engagement can have a significant effect on the international students' cultural and social adjustment to the U.S. culture life. This dissertation studies the extent of engagement in social activities among international doctoral students because the nature and frequency of social interactions with people greatly influences international students' ability to accomplish their academic goals (Poyrazli, 2002).

This research will study international doctoral students in different phases of doctoral programs as defined by Gardner (2009). Studying the three stages of doctoral education is important for this study in order to understand the students' engagement in academic and social activities during the different stages of their doctoral education. For instance, the students may engage in social activities more during the first stage than in the second or the third stage of the education. Because the first stage involves meeting new people and interacting with university and department personnel and peers during orientation and thereafter, exploring the campus and participating in various activities offered for new students can be helpful. Students may engage in academic activities more in the second and third stages when they are taking classes, conducting research, and writing a doctoral dissertation.

Each phase of doctoral study is unique for these students because it may have an important effect on the student's doctoral study outcome. It can even have a significant effect on the length of time that the student takes to complete the doctoral program. For example, the dissertation writing phase is the longest period to complete (Rao, 1995). Another reason why

international students remain in the doctoral program longer than necessary is that immigration restrictions require students to leave the country upon completion of the degree unless they have a job (Rao, 1995). Hence, international doctoral students may not try to defend their dissertation even if it is completed. They try to secure a job before they complete their doctoral program because they will become ineligible to stay in the United States if they finish their degrees without a job (Rao, 1995). The literature suggests that international doctoral students are less likely to drop out of their programs if they are concerned about losing their immigration status in the United States. Also, immigration restrictions do not allow international students to get a full-time job prior to completing their academic programs (Rao, 1995), while American doctoral students have the alternative of getting a full-time job even if they drop out of the program.

Very limited amount of research has been conducted to suggest ways on how to make doctoral study efficient and less stressful for international doctoral students. Doctoral programs will benefit from understanding the problem of student engagement and academic gains among international students. Also, when doctoral students complete their degree successfully, the reputation of the program is likely to grow and help doctoral programs remain competitive (Elsey, 2007).

Opportunities for International Students: Academic Gains and Satisfaction

Based on the three stages of doctoral education, Gardner (2009) describes academic gains among students in doctoral programs. Passing through the stages of entry, integration, and candidacy, doctoral students face the challenges of successful completion of coursework, comprehensive exams, and dissertation (Gardner, 2009). While taking courses in their discipline, students start acquiring academic knowledge and skills in reading, writing, speaking, and

analyzing the course materials. In the integration and candidacy stages of their doctoral programs, doctoral students develop research skills while taking candidacy exams and writing their dissertation. In this stage, students also start seeking professional positions, preparing for professional roles, and making decisions for career plans, which are the indicators of career preparation (Gardner, 2009).

Acquisition of Academic Knowledge and Skills

Acquisition of academic knowledge and skills is a central part of an academic journey. Students start this process in the integration phase of their doctoral education, which includes a demonstration of competency and skills in coursework (Gardner, 2009).

A body of research indicates that international students with prior English language proficiency and strong academic preparation demonstrate success in achieving their academic goals, overall academic adjustment (Ramburuth & McCormick, 2001; Stoynoff, 1997), and have lower levels of stress (Yeh & Inose, 2003). English language proficiency has been pointed out as a significant factor in international students' success (Abel, 2002; Poyrazli & Grahame, 2007). Not only is English language proficiency important in comprehending and communicating academic material, but it is also linked with a student's individual confidence level (Heggins & Jackson, 2003). Academic achievement of international students who already had a degree from a U.S. institution prior to starting their doctoral study may be different due to their level of proficiency in English as compared to those international doctoral students who did not have a prior academic experience in a U.S. institution. Therefore, the survey for this study asked the international doctoral students to indicate if they had attended another U.S. higher education institution prior to the doctoral degree program they were enrolled in at the time of the survey completion.

Development of Writing Skills

Writing proficiency plays an important role in doctoral education (Cotterall, 2011). Doctoral students are required to develop writing skills, which is one of the core academic gains during doctoral education (Gardner, 2009; Golde, 1999). However, it is not an easy and smooth step for international doctoral students. Doctoral writing can be a source of considerable anxiety, and in particular, international doctoral students need assistance, support, and encouragement if they are to develop confidence and competency in writing at a doctoral level (Cotterall, 2011). Peer interaction is an important aid for doctoral students in writing because it helps to put their conceptual knowledge in writing through the communication and learning that occurs from exchanges with each other (Cotterall, 2011).

Development of Research Skills

Development of research skills is a critical element of the doctoral education. The awarded degree for academic research in a given field represents original knowledge, typically including the production of a doctoral dissertation, which demonstrates the research done by that candidate (Gardner, 2009). Although the PhD is considered a research degree and doctoral recipients are expected to be trained to conduct rigorous research (Golde & Dore, 2004), international students struggle with completing research papers and taking notes during lectures due to their limited language proficiency (Li, Fox & Almarza, 2007). International students face a number of challenges in developing research skills in their doctoral programs. After finishing their coursework, doctoral students move to their dissertation stage and start seeing themselves in a larger role of knowledge producers, rather than learners (Gardner, 2009). Using technology in doing research, the basics of doing research, and developing the research skills in terms of doing qualitative and quantitative research are considered to be the core for doctoral students in the

development of research skills (Gardner, 2009; Golde, 1999).

Career Preparation

Gardner (2005) points out that career guidance and preparation are important to all doctoral students, regardless of their future plans and career interests. Several studies on international doctoral students discuss preparing the students for their future career after completing their programs (Golde & Dore, 2004; Heng-Yu Ku et al., 2008; Nerad, 2004) and the achievement of their career aspirations as an ultimate goal of international students (Shen & Herr, 2004). American doctoral students may already be employed when they start their doctoral degree, but the case of international students is different. For example, the qualitative study by Heng-Yu Ku et al. (2008) examines a team-based International Doctoral Student Support Group (IDSSG) that was led by faculty as mentors for international doctoral students. The group was designed particularly around the problems in preparing and mentoring international doctoral students for careers in academia. Significant benefits were obtained by developing international doctoral students for future career needs while they are in the midst of pursuing their degree.

By discussing the term "career preparation of international doctoral students," this study does not mean training the students for future jobs. This study instead focuses on the opportunities that should be given to international doctoral students so that they can learn about job opportunities in their field, discuss their career plans with faculty and their advisors, prepare their resume, and start building professional networks. I hypothesize that if the students are encouraged to be engaged in academic and social activities during their doctoral education, they can better achieve their goals in career plans than will those students who try to build their career independently without any help in the career preparation by their department or university.

Successful entry into a professional career requires an advanced level of specialized

knowledge. The skills and active participation in academic and social activities can help students gain the knowledge, skills, and values that are necessary to prepare them for a professional career (Gardner, 2005). Therefore, this study focuses on levels of knowledge and skills that the doctoral students possess while pursuing their doctoral degrees. The impact of international students' engagement in academic and social activities on their career preparation has been investigated in this study.

Career preparation is not a separate process in the doctoral programs; it is instead a continuous process of gaining academic and research skills that doctoral students experience during their study. The coursework in doctoral programs can be an important part of the academic experience for doctoral students because it prepares them for future professions (Gardner, 2005). Peer relationships, student-faculty interactions, and working on research projects are also important means for doctoral students to get ready for their professional careers (Gardner, 2005). Career preparation is looked upon as a part of academic gains during doctoral programs because academic gains are associated with both the desire to be prepared for a full-time professional career and plans to attain an advanced degree (Miles, 2009).

As the international doctoral students are the major focus of this study, it should be noted that international graduate students endure physical and emotional costs to pursue their ambitions and dreams through studying overseas with the major focus on the achievement of their own career plans (Shen & Herr, 2004). Moreover, they feel more optimistic than domestic doctoral students about their future careers (Harman, 2003), expecting to follow research careers and enhancing their career prospects. In a study of PhD students, Harman (2003) found that academic positions as a university lecturer were attractive to a substantially higher proportion of international students but postdoctoral positions were less attractive, mainly because many

international students tend to be mature-aged, mid-career professionals with permanent jobs in their home countries to which they can or must return.

A qualitative study by Shen and Herr (2004) investigated the career placement concerns of international graduate students returning to their home countries, heading to other countries, or remaining in the United States after completing their degree. The study talks about the career decisions of international graduate students and the reasons to decide to get a job in the United States or return to their home countries after graduation. The researchers concluded that the students (18 international students, 1 naturalized status student, 3 faculty members, and 2 career counselors) possess diverse career plans influenced by several unique factors. According to Shen and Herr (2004), career preparation among international graduate students should be supported by the information, resources, and networks that their academic departments provide for them.

Another source of help comes from student engagement in professional activities or academic departments (Shen & Herr, 2004), as students have chances of meeting employers through doing research and attending conferences. Job positions advertised through the academic departments are also considered helpful for the international graduate students. The study pointed out that international graduate students were inclined to use the sources from their own academic fields instead of using the career services at their universities in preparing to enter the professional career (Shen & Herr, 2004). The reason why the international students in this study didn't use the career services at their university was that they thought those services were for undergraduate students. The results of this study underline that although the United States remains the leading host to foreign students worldwide, existing campus services are designed primarily for domestic undergraduate students. As a result, it is challenging for educators and career service providers on the U.S campuses to respond to the geographic and cultural diversity

of international students effectively (Leong & Sedlacek, 1989; Shen & Herr, 2004).

Teaching or research assistantships are considered important factors for doctoral students that help prepare them for their professional career as well (Gardner, 2005; Harman, 2003). Though considered as the form of financial and support, teaching and research assistantships can provide a vast opportunity for doctoral students to be actively engaged in their academic departments, interact with faculty and staff, and socialize with their peers. This study examines the relationship of the teaching and research assistantships with the academic achievement among international doctoral students.

Academic Satisfaction

Satisfaction with the doctoral experience is considered to be one of the main reasons for doctoral students to persist in the program and complete their degree (Willis & Carmichael, 2011). Doctoral students express a high degree of satisfaction in the entry stage of doctoral education, which is related to their coursework (Harman, 2003). However, in the integration and candidacy stages of doctoral education (Wei, 2001), the students reported that their doctoral course work did not prepare them for the comprehensive or qualifying exams and dissertation. The doctoral students felt that the faculty in their academic departments did not take it as a professional responsibility to prepare students for the comprehensive or qualifying exams and the dissertation (Wei, 2001). Similarly, a study by Harman (2003) states that there are concerns about the quality and effectiveness of supervision and help provided in designing research projects and preparing the students for writing doctoral dissertations. Correspondingly, the research on doctoral students calls for the doctoral programs to be aware of the influences that faculty has upon students' satisfaction with their programs (Gardner, 2005).

The study by Gardner (2005) found that the doctoral students who are supported by the

faculty and peers were the most satisfied in their programs (Gardner, 2005). Measuring student satisfaction is important for institutions because it can be useful for them to see their strengths and identify areas for improvement (BC College & Institute Student Outcomes, 2003). That is why this study examines the level of student satisfaction with the academic gains during doctoral education.

Student Engagement

One of the factors related to achieving academic goals is student engagement in educational and social activities among undergraduate students (Kuh, 2001). That is why this study is built on the theory of student engagement, which refers to the amount of time and effort students put into their studies, and other activities that lead to the experiences and educational outcomes that constitute student success (Kuh, 2001). Engagement emphasizes two elements--what the student does and what the institution does--pointing to activities on the part of the individual student and the institution that are related to desired outcomes of college (Wolf-Wendel et al., 2007). In this study, I looked at these two elements because the departmental and institutional contexts in which doctoral students are educated play a significant role in students' education and development (Gardner, 2009). Consequently, the survey included a number of questions on institutional emphasis regarding engaging students in educational and social activities.

Theories on Student Engagement

The literature provides limited information on the social part of doctoral education in past years. In the last decade, student engagement has been suggested as a good predictor of learning and personal development of domestic undergraduate students (Carrini, Kuh & Klein, 2006). The

literature states that college students who are engaged in activities that are educationally productive develop habits of the mind that enlarge their capacity for continuous learning and personal development (Shulman, 2002). A multitude of research exists on undergraduate students' engagement, starting from its concepts and description all the way up to its linkages to student learning, development of skills, and growth among college students. Kuh's (2001) theory of student engagement suggests that student's engagement in educationally purposeful activities has a positive impact on his or her development and learning as educational outcomes. Moreover, it leads students to feel increased satisfaction with the entire college experience (Kuh, 2001).

Kuh's theory of student engagement is based on five benchmarks:

1. Level of Academic Challenge (LAC)
2. Active and Collaborative Learning (ACL)
3. Student-Faculty Interaction (SFI)
4. Enriching Educational Experiences (EEE)
5. Supportive Campus Environment (SCE)

These five benchmarks were produced using the results from the National Survey of Student Engagement (NSSE), which was specifically designed to assess the extent to which students are engaged in educationally purposeful practices and what they gain from their college experience (Kuh, 2001). The survey for this study employed a number of selected items from the engagement scales of the NSSE in order to examine the extent to which international students are engaged academically and socially during their doctoral education. Because the NSSE focuses on undergraduate students and doctoral students differ from undergraduate students in many aspects of college life (Gardner, 2009; Golde, 1999), the survey questions for the study were

selected on the basis of the concepts that the theory supports for research on doctoral students.

The first benchmark, level of academic challenge of student engagement, includes 11 items that focus on student preparation for coursework, writing, and reading skills; the ability of implying a theory into practice; making judgments about problems; and the time spent by students on preparation for class (Kuh, 2001). The extent of the institutional emphasis on time spent on studying and academic work is measured by LAC as well. The survey for this study included the following selected questions from this benchmark:

1. On average, how many hours a week do you spend doing academic work (studying, reading, writing, doing lab work, analyzing data, and other academic activities)?
2. While you were taking courses in the current doctoral program, how often have you worked harder than you expected to meet a course instructor's standards and expectations?
3. To what extent does your academic program emphasize spending significant amounts of time studying and doing academic work?

International doctoral students experience academic issues common to all doctoral students, but in addition they are challenged to adapt to an unfamiliar language, culture, and system (Gardner, 2009). The academic challenges commonly expressed by international students include prior academic preparation, adjustment to foreign teaching methodology, and pressure from performance expectations, curriculum content, and workload issues (Moffett, 2006; Nerad, 2004). The literature notes that considerable variation exists in the educational background of students who are admitted to foreign education programs (Huntley, 1993). Some students rank in the top levels of school programs in their home countries, and while these students are used to being top achievers, the challenges of a new curriculum may disrupt prior levels of academic success and create added pressures for redefining personal competencies (Li, 2007; Lin & Yi,

1997; Yeh & Inose, 2003; Walker, 2001). These academic challenges can force the international students to miss the status that they previously held as an outstanding performer in their home community.

Studies by Arthur (2004) and Garrod and Davis (1999), on the other hand, point out that for many international students, prior experience exceeds the curricula in academic programs in the host country. Those international students, whose academic and employment background is more extensive than those of local students, may be frustrated about the lack of academic challenge (Garrod & Davis, 1999). The issue becomes how well the background experience of students matches the curriculum of the academic program of their department in a U.S. university. Those students who feel they are duplicating prior learning are likely to be frustrated about "wasting their time" and money (Bradley, 2002). In addition, international graduate students who have scholarships from their home country need to demonstrate a certain level of academic achievement to maintain their scholarships (Poyrazli, 2006).

The second benchmark, active and collaborative learning of student engagement, consists of seven items that analyze classroom participation, frequency of working with other students on class projects in class and outside of class, and educational discussions of class materials with peers (Kuh, 2001). Participation in the classroom is considered to be a problematic area that international students face during their doctoral education in the U.S. higher education institutions. International students asking questions in class or contributing to class discussions have been discussed in a number of research studies that have pointed out that the classroom environment can be difficult when expectations for learning are not clearly defined and when teaching styles conflict with previous learning experiences (Arthur, 2004; Dee & Henkin, 1999; Lin & Yi, 1997; Moffett, 2006; Wan, 2001; Yeh & Inose, 2003). For example, students from

countries where the teaching methodology is more autocratic in style may miss the usual structure, clear expectations, and the formal lines of authority that are followed during student-instructor interactions (Arthur, 2004). International students who are used to a highly organized, lecture-style of instruction and a highly structured curriculum may find that popular constructivist and collaborative approaches to education are confusing (Garrod & Davis, 1999).

Another influence on the academic experiences of international doctoral students is the types of examples used in classroom discussions of theoretical concepts (Moffett, 2006). When the examples are derived solely from the host environment or culture, international students may not be able to relate to the example or they may feel that they are being excluded from the discussion (Li, 2007; Poyrazli, 2007). As a result, international doctoral students feel like they do not belong in the local academic context and miss the opportunity of participating in class discussions that is a part of their academic engagement as shown in this benchmark. In order to measure the extent of international students' active and collaborative learning ability, the following questions from this benchmark were used in the survey:

1. During your study in the current doctoral program, how often have you asked questions in class or contributed to class discussions?
2. During your study in the current doctoral program, how often have you worked actively with other students on projects during class?
3. During your study in the current doctoral program, how often have you worked with classmates outside of class to prepare class assignments?

The third benchmark of student engagement theory, student-faculty interaction, consists of six items that measure the interaction between students and faculty including discussions on assignments, class materials, and career plans with a faculty member or advisor. This benchmark

examines the frequency of student-faculty working on research projects as well (Kuh, 2001). Student interactions with faculty outside the classroom and the quality of the student-faculty relations are related to the academic achievement of students (Ullah, 2007). The relationship with faculty is particularly important for international doctoral students because they have a high level of adjustment to the American culture, have difficulties with language barriers, and are attempting to understand the culture of the U.S. universities (Heng-Yu Ku et al., 2008).

Supportive student-faculty interaction is necessary, especially for the international students in doctoral programs. A good academic advising and mentoring service is critical to the success of international doctoral students, as they usually report experiencing a sense of isolation from their academic department (Wisker, 2007). Orientation and the other engagement activities in the academic department were found to be important factors for the successful experiences of doctoral students (Wei, 2001); therefore, examining doctoral student engagement in academic departments and its relationship to the academic achievement of the students is one of the key elements of this study.

The study by Zhao et al. (2005) on doctoral student-advisor interaction and student satisfaction found that the quality of the relationship between doctoral student and advisor, good or bad, directly influences the quality of the doctoral education experience. As Zhao states, "A positive relationship has positive outcomes for students, including a positive departmental environment, successful socialization into department and discipline, and timely completion of the degree" (Zhao et al., 2005, p1). Studies have shown that there are significant barriers and socialization needs for graduate students within the department (Golde, 1994; Lovitts, 1996). Student-faculty interaction is a significant factor in achieving academic goals for international doctoral students who have, in particular, different levels of dependency and are in need of

conducting supervised research (Anaya & Cole, 2001).

Golde (1999) talks about faculty-student interaction and the role of an academic advisor in a graduate student's academic life. The most critical decision that a graduate student makes is choosing an advisor with whom to build a supportive professional relationship (Golde, 1999). This is because "the student is shaped and changed by the advisor: learning how to identify and think through a problem, how to conduct high-quality research, how to write manuscripts and where to publish them" (Golde, 1999, p. 283). Heng-Yu Ku et al. extend this to international students, saying, “Academic advisors play an important role for students, especially international students” (Heng-Yu Ku et al., 2008, p373). Indeed, graduate school is a time for students to develop the skills that will allow them to succeed in their chosen field.

Even though relationships with family members, colleagues, and professors are viewed by doctoral students as important factors that could impact their doctoral studies, faculty advising and mentoring are reported as lacking for doctoral students (Wei, 2001). The interaction with faculty should be encouraged for international students in doctoral programs because they come from different educational system and different learning styles. Interaction with the academic advisors and other faculty members can assist the students to learn about the important aspects of academic requirements that are new and unfamiliar to them.

The fourth benchmark, enriching educational experiences of student engagement theory by Kuh (2001), has 12 items that examine students' interaction with others who are from different backgrounds and possess different values, including the institutional efforts to encourage the interaction between students from different groups. This benchmark also measures student participation in co-curricular activities such as student organizations, sports, and community service (Kuh, 2001). Similarly, the studies on doctoral students emphasize the

benefits of participating in local graduate student organizations or in nationally affiliated professional associations for doctoral students (Gardner, 2007; Golde, 1999).

The qualitative study of 10 doctoral students by Gardner and Barnes (2007) explored influences and benefits of graduate student participation in local, national, and professional associations and organizations. Based on the literature on doctoral students, a few questions from NSSE were modified with permission from the Trustees of Indiana University, The College Student Report, National Survey of Student Engagement, (NSSE Item Usage Agreement is appended as Appendix B). As NSSE focuses on the undergraduate student population, only those questions that are related to doctoral students were employed for this study.

It is important to note that that the EEE benchmark is different from the social engagement scale in this study because the social engagement scale in the survey measures student engagement in extra-curricular activities, such as attendance of dance, music, theater performance, or art exhibitions. It also measures the institutional support for international doctoral students to socialize with people. Engagement in extra-curricular activities includes student participation in activities that are not related to their academic program, such as participation in campus groups, clubs, and organizations. The EEE benchmark analyzes student engagement in educationally purposeful activities, which is called participation in co-curricular activities by Kuh (2001).

The fifth benchmark of student engagement, supportive campus environment, consists of 6 items that look into the institutional support of students' academic success in college. It also examines the quality of relationships among students, faculty, and administrative personnel of the institution (Kuh, 2001). The department, laboratory, and other academic and research facilities are considered to be the most important environmental contexts. Having a supportive

campus environment could result in production of larger numbers of researchers who conduct high-quality, innovative research in doctoral programs (Lovitts, 2005).

The literature indicates that campus support is critical to keeping stress low for international students because they encounter a number of issues during their transition period and adjustment to the host institution (Brent, 2002). Institutional support, if adequately formed, could help international graduate students have less stress and achieve their academic goals during their study. To survive in the academic communities, international students are required to negotiate the system, master the language, and access information; to assume that the present campus services, which are primarily designed for U.S. students, can meet the unique needs of foreign students would be serious ignorant of their concerns (Wisker, 2007). For example, at a start of their doctoral program, a departmental orientation is an important part for international students in adapting to a new academic environment; however, there are still many departments that do not provide orientation for newly admitted international students (Heng-Yu Ku et al., 2008).

The five benchmarks of educational practices discussed above analyze student engagement in educationally purposeful activities. However, there is one more integral part of the college experience that is discussed by many researchers as participation in social activities**.** Al-Sharideh and Goe (1998) consider that it is important for international students to be engaged in the social environment of U.S. universities in order to have high self-esteem and achieve success in the academic arena. The next part of the chapter will discuss what social engagement is and why it is important for doctoral students.

Social Engagement

In this study, social engagement is defined as students' participation in extra-curricular activities, such as attending clubs, organizations, and student associations that are not related to the academic purpose or academic requirement of the doctoral program. Participation in extra-curricular activities is positively related to satisfaction and gains in social competence, confidence, and autonomy (Kuh, 1995).

Through social engagement, the doctoral student acquires knowledge and skills necessary to enter to the professional area and succeed in it (Gardner & Barnes, 2007). Social engagement can give international doctoral students the opportunity to learn how to adopt the values, skills, attitudes, norms, and knowledge needed for membership in a society that can foster the students' career preparation (Gardner & Barnes, 2007). Engagement at the undergraduate level has been linked to positive educational outcomes such as learning and personal development, academic achievement, retention, and academic satisfaction (Kuh, 2001; Astin, 1993; Pascarella & Terenzini, 1991). However, studies related to the benefits, correlations, and outcomes of graduate student engagement have not been conducted with the exception of a very few (Gardner, 2007).

The literature on international graduate students underlines that international graduate students often experience feelings ranging from reluctance to anxiety about their need to access social support in the host culture (Garrod & Davis, 1999). It is important that the international graduate students create meaningful relationships with their peers and connect with the campus community in order to enhance their academic network (Heng-Yu Ku et al., 2008). For example, Asian doctoral students are socially isolated, but they welcome opportunities to be part of organized outings (Moffett, 2006). One type of social engagement for international students is

being involved in friendship networks, which is a critical factor in how well international graduate students deal with stress. The literature indicates that those who have a strong social support system tend to adjust more quickly and effectively to college life in their host country (Bradley, 2000; Moffett, 2006; Garrod & Davis, 1999).

Social engagement is found to be important to not only undergraduate students, but also to those who are in graduate programs (Gardner, 2009). For international graduate students, lack of social support is a direct source of stress and, conversely, the availability of social support has a positive impact on the college experience among international students (Garrod & Davis, 1999). When international graduate students feel overtaxed by the demands perceived in the new culture, social support can help to moderate the impact of those demands. In either case, if sources of support are inadequate, international graduate students may experience high levels of stress (Li, 2007).

Coupled with the demands of the academic systems and studying in a second language, international graduate students' relationships with other students may be an essential source of support for them (Arthur, 2004). Though the adjustment issues among international PhD students is not the main focus of this study, the elements of the overall experience in the United States seem to be closely connected the academic achievement of the international students. Participation in extra-curricular activities and interaction with other students are the forms of social engagement that are important not only on undergraduate level but also on graduate level (Gardner, 2009).

In this chapter I discussed the literature on the key words of this dissertation: *three stages of doctoral education, international students, student engagement in academic activities, student*

engagement in social activities, and academic gains in doctoral education. The next chapter focuses on the research design, the research questions, population of the study, survey construction and administration, independent and dependent variables, validity and reliability of the research questions, data preparation, and methods of statistical analysis in this dissertation.

CHAPTER THREE

RESEARCH METHODS

Overview

When discussing the possible relationships between student engagement and student academic achievement among international doctoral students, at least five questions can emerge from the perspectives of this research. Do international doctoral students engage in academic or social activities during their study? If yes, what is the extent to which they engage in activities related to their academic and social life in the United States? Are there any other characteristic features of the students that may affect their engagement in academic and social activities? Do international doctoral students pursue their academic goals during their study in the U.S. universities? Is there any relationship between the students' engagement in academic/social activities and their academic gains in pursuing a doctorate degree in the U.S. universities? Examining these questions provides an insight into discovering possible relationships between student engagement and academic gains for international doctoral students at different stages of doctoral programs in the U.S. universities.

This study employed a quantitative research design to investigate (a) the extent to which international doctoral students engage in academic and social activities, and (b) possible relationships between student engagement and self-reported academic gains among international students in doctoral programs.

Research Questions

The following research questions were addressed in this study:

1. How is engagement in academic and social activities related to the acquisition of academic

knowledge and skills in the area of doctoral study among international doctoral students?

2. How is engagement in academic and social activities related to writing clearly and effectively among international doctoral students?
3. How is engagement in academic and social activities related to presenting a research at conferences, seminars and workshops among international doctoral students?
4. How is engagement in academic and social activities related to publishing a research in scholarly journals among international doctoral students?
5. How is engagement in academic and social activities related to the career preparation (preparation for professional role, job search, and decisions for career plans) among international doctoral students?
6. How is engagement in academic and social activities related to satisfaction with academic gains among international doctoral students?

Population of the study

The target population of the study was international doctoral students, as defined by non-permanent resident status in the United States, in six research universities. It included all doctoral students without U.S. citizenship or permanent residency (all visa types) in these six universities. The universities selected for the study were as follows:

1. **Iowa State University.** 1078 international students were enrolled in doctoral programs at the time of survey completion.
2. **Kansas State University.** 470 international students were enrolled in doctoral programs when the survey was sent to the university.
3. **North Dakota State University.** 276 international students were enrolled in doctoral

programs at the time of survey completion.

4. **University of Kansas.** 234 international students were enrolled in doctoral programs at the time of survey completion.
5. **University of Missouri -- Kansas City.** 167 international students were enrolled in doctoral programs when the university received the survey.
6. **University of Nebraska – Lincoln.** 660 international students were enrolled in doctoral programs at the time of survey completion.

The statistical data about international doctoral students at the universities was obtained with the collaboration of the International Student and Scholars Offices and the Registrar's Offices of the universities.

The total number of the students who received the survey was 2885, and 427 completed surveys were received. About 15 % of responses were received, close to the initial target that was set before sending the survey.

Survey Construction and Administration

The purpose of the International Doctoral Student Engagement Survey (IDSES), designed for this study, was to (a) to gain information on the extent of student engagement in educationally and socially purposeful activities, (b) to ask the students about their academic gains in four areas, and (c) to gather demographic information about the survey respondents. The survey for this study was modeled after the National Survey of Student Engagement (NSSE). The license for using the survey items was granted for this study by Indiana University Center for Postsecondary Research (Appendix B). However, as the survey addresses undergraduate student population particularly, additional questions were constructed to consider the

international doctoral students population under the study. Content validity of the additional questions was addressed throughout the construction of the IDSES, as items were developed based on literature review.

The survey consisted of 30 questions as well as 9 demographic questions (See Appendix C for a copy of the survey). These questions primarily focused on obtaining the following information related to the survey respondents:

I. Level of academic challenge (3 items)

II. Active and collaborative learning (3 items)

III. Student-faculty interaction (5 items)

IV. Enriching educational experiences (2 items)

V. Supportive campus environment (6 items)

VI. Engagement in social activities (3 items)

VII. Academic gains (7 items)

VIII. Academic satisfaction (1 item)

The IDSES was developed through a web-based survey tool SurveyMonkey (www.surveymonkey.com). Web-based survey facilities are considered to be (a) cost effective, (b) support current research and survey methodology, (c) have alternative educational applications and (d) have broad academic acceptance and intake (Pocknee & Robbie, 2002). As the number of internet users in the world doubles every year, researchers are using internet tools such as e-mail and web-based surveys more often as there is a wide variation in response rates and the speed of response for web-based surveys (Cobanoglu, Warde & Moreo, 2001). The link to IDSES was disseminated by the mailing list to all international doctoral students through collaboration with the Offices of International Student and Scholar Services (ISSS) at six

research universities: Iowa State University (ISU), Kansas State University (K-State), North Dakota State University (NDSU), the University of Kansas (KU), the University of Missouri – Kansas City (UMKC), and the University of Nebraska – Lincoln (UNL). The survey was sent to the international students in mid-February of the spring semester 2010. The students received the survey a second time as a reminder at the beginning of March 2010. The third reminder for the survey completion was sent to international doctoral students in late March 2010. The approval from Human Subjects Committee Lawrence (HSCL) was obtained before the survey dissemination (Appendix A).

Variables

The study has 11 independent variables that measure student engagement in academic and social activities. Ten of the independent variables are based on Kuh's benchmarks of student engagement in educational activities (Kuh, 2001). They are as follows: (1) time spent on academic work, (2) working hard to meet instructors' course requirements, (3) programmatic emphasis on studying, (4) active and collaborative learning, (5) student-faculty interaction, (6) participation in co-curricular activities, (7) technology usage, (8) supportive campus environment, (9) programmatic emphasis on socializing and (10) attendance of various events. The eleventh independent variable was made on the basis of the theories of engagement in activities, which are not related to the academic program for international doctoral students and consequently, is named participation in extra-curricular activities (Gardner, 2009; Golde, 1999; Moffett, 2006). Three of the independent variables – active and collaborative learning; student-faculty interaction and supportive campus environment – contained several items that measure student engagement in academic and social activities during the study in doctoral programs.

There are 6 dependent variables, which measure self-reported academic gains among international doctoral students in this study. Three of the dependent variables are based on Kuh's study (2001), which are as follows: (1) acquisition of academic knowledge and skills, (2) writing clearly and effectively and (3) satisfaction with academic gains. Three of the dependent variables are based on Gardner's theory on doctoral education (2009), which are (4) presentation of research, (5) publishing research and (6) career preparation.

The following are control variables:

1. The length of time the students had spent in their doctoral program
2. Financial support provided for the doctoral education
3. Attendance at any other U.S. college or university than their current university

Validity and Reliability

The IDSES was created based on the information gathered through the literature review. The information about literature sources for the survey items is provided in Appendix C. As IDSES was modeled after NSSE, which focuses on undergraduate student engagement in educationally purposeful activities, several questions were added to the survey for this study to better examine the research questions in accordance to (a) the international doctoral student population particularly, and (b) engagement in social activities among international doctoral students. The additional questions were as follows:

1. During your study in the current doctoral program, how often have you participated in extra-curricular activities that are not related to your academic program (campus groups, clubs, organizations, programs, etc.)?
2. Compared to the time when you first enrolled in the current institution, how would you rate

your academic gains in presenting your research at conferences, seminars and workshops?

3. Compared to the time when you first enrolled in the current institution, how would you rate your academic gains in publishing your research in scholarly journals?
4. Compared to the time when you first enrolled in the current institution, how would you rate your academic gains in career preparation (preparation for professional role, job search, decision in career plans)?
5. To what extent are you satisfied with your academic gains in current institution?
6. What doctoral degree program are you currently enrolled in?
7. What stage of doctoral program are you in now?
8. How long have you been in your current program?
9. Select the financial support you have been provided for your doctoral degree from your current university (check all that apply).
10. Do you have any other academic degree from your current university?
11. Did you attend another U.S. college or university before coming to your current university?

To minimize the effects of measurement errors, the IDSES was then reviewed with the dissertation proposal committee members for feedback regarding survey completion time, the survey appropriateness for doctoral students, clarity of survey questions, and ease of the survey completion. In order to check the internal consistency of the IDSES items, Cronbach' Alpha internal consistency estimate was computed for the following scales:

1. Level of Academic Challenge
2. Active and Collaborative Learning
3. Student-Faculty Interaction
4. Enriching Educational Experiences

5. Supportive Campus Environment
6. Engagement in Social Activities

As IDSES was modeled after the NSSE, there are five general conditions that make self-reports valid (Kuh, 2004): (a) when the information requested is known to the respondents, (b) the questions are phrased clearly and unambiguously, (c) the questions refer to recent activities, (d) the respondents think the questions merit a serious and thoughtful response, and (e) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways.

Data Preparation and Methods of Statistical Analysis

The main emphasis of the survey was (a) to evaluate engagement in academic and social activities among international doctoral students, (b) to gather the information on self-reported academic gains among the students, and (c) to collect the demographic information about the survey respondents.

The first step in the process of the data analysis was to convert the survey responses to the numeric data for SPSS. The data from the IDSES was received in Microsoft Excel format, which was then imported to SPSS for statistical analysis. Each row in the SPSS dataset represented the individual scores of the international doctoral students on the items, which were the scales for the independent variables, dependent variables, and the questions on demographic information. The columns in the dataset represented the independent variables, dependent variables, and demographic questions that were measured on each student. The demographic data such as the stage in the doctoral program, time in the program, type of the doctoral degree program, and country of origin, etc. were entered last in SPSS dataset.

The second step in the statistical analysis was to compute the reliability for each subscale (the items that make up each of the IVs), by running reliabilities analysis. Cronbach's alpha was used to measure the amount of internal consistency for 6 scales:

1. Level of academic challenge (3 items)
2. Active and collaborative learning (3 items)
3. Student-faculty interaction (5 items)
4. Enriching educational experiences (2 items)

5 Supportive campus environments (6 items)

6. Engagement in social activities (3 items)

Cronbach's alphas for the independent variables were examined, and some were quite low. For example, the independent variable *Level of Academic Challenge (LAC),* which had three items (questions) had an alpha level of only .023, essentially indicating that the items were weakly correlated with each other. They should have high correlations with each other before they are combined and their mean score used as a variable. The other independent variables that were concerning were the variables *Enriching Educational Experiences (alpha = .173),* and *Engagement in Social Activities (alpha =.384).* Because of low alpha reliability scores, it was decided to use each item from these three independent variables as its own predictor (i.e., time for academic work, work hard to meet instructor's demands, and academic program emphasis on studying). As a result, the following independent variables were formed: (1) time spent on academic work, (2) working hard to meet instructors' course requirements, (3) programmatic emphasis on studying, (4) active and collaborative learning, (5) student-faculty interaction, (6) participation in co-curricular activities, (7) technology usage, (8) supportive campus environment, (9) programmatic emphasis on socializing, (10) participation in extra-curricular

activities, and (11) attendance of various events.

Descriptive data analysis

The third step in the data analysis was to compute descriptive statistics for the following demographic variables:

1. Current university where the students are enrolled
2. Type of doctoral program
3. Stage of doctoral program at the time of survey completion
4. Time in program at the time of completing the survey
5. Financial support provided for doctoral degree from current university
6. Academic degree other than current from the university enrolled at the time of survey completion
7. Attendance of any other U.S. college or university than the current one
8. Country of origin

In order to provide a picture of the extent to which the international doctoral students in six universities engaged in academic and social activities, the fourth step was to run descriptive analysis to compute means (M), standard deviations (SD), frequencies (F) and percentages (%) for eleven independent variables and six dependent variables.

The fifth step in the data analysis was to compute bi-variate correlations in order examine the strength of the associations between independent and dependent variables.

The sixth step in analyzing the data was to conduct multiple linear regression analysis in order to examine a relationship between engagement and self-reported academic gains of international doctoral students. Regression analysis was performed while controlling for the time

in program, financial support, and attendance at another U.S. institution. In statistical terms, using a multiple regression technique to analyze the data from the survey led this research to "explain the variance in the level of one variable on the basis of the level of other variables" (Brace et al., 2009). Beta values of the variables were computed to see how strongly engagement in academic and social activities influences the academic gains of the doctoral students. The beta regression coefficient also assessed the strength of the relationship between each independent variable to the dependent variable (Brace et al., 2009). In order to measure the association between the observed value and predicted value of the scores on academic achievement, the R-value was reported in the results as well.

Limitations

The first limitation of this study is that it measured academic achievement of the international doctoral students based on their self-reported academic gains. When students self-report information about their academic experiences, it may or may not be accurate because it is only the assumption of human cognition (Porter, 2011). That is why, the questions about the validity of the survey responses might arise in the studies which have the self-reported data.

The second limitation for this study is that it could have used other variables such as a marital status of the survey respondents, their age and gender in order to compare the extent of student engagement and its relationships to the students' academic gains based on their different characteristics such as age, marital status and gender. However, as this study focused on the other variables such as the time spent in doctoral education, financial support that the students were provided for their doctoral education from their current institution and their attendance at another U.S. university, the demographic data on the students' marital status, age and gender was

not collected. For the future research, it would be important to consider different characteristics of doctoral students when examining their academic and social engagement because their marital status, age and gender may affect their extent of engagement in academic and social activities during doctoral education.

The third limitation of the study is that I received 427 completed surveys which make 15% of the total number of the survey recipients. Perhaps, with higher number of the responses, the results of this study could be generalized for the population of international doctoral students in research universities located in the Midwest region of the United States.

CHAPTER FOUR

RESULTS

This study examined international doctoral student engagement in academic and social activities and its relationship with self-reported academic gains in six research universities. The study had eleven independent variables based on the theories of student engagement in educationally purposeful activities and social activities. There were six dependent variables in the study based on the self-reported academic gains of the international doctoral students.

International Doctoral Student Demographics

Demographic information included the current university where the students were enrolled at the time of the survey completion, the type of the doctoral program they were enrolled in, the stage of doctoral program at the time of the survey completion, the time in the doctoral program at the time of completing the survey, financial support provided for their doctoral degree from their current university, any academic degree other than the students' current degree from the university they were enrolled at the time of the survey completion, attendance at any U.S. college or university other than their current university, and their country of origin.

Participants

The study initially intended to include a sample of international doctoral students from four research universities. However, in the process of the International Doctoral Student Engagement Survey (IDSES) administration, I decided to include more universities in order to have a larger sample for the study. With the collaboration of the International Student and Scholars Offices and Registrar's Offices at Iowa State University (ISU), Kansas State University

(K-State), North Dakota State University (NDSU), the University of Kansas (KU), the University of Missouri – Kansas City (UMKC), and the University of Nebraska – Lincoln (UNL), the IDSES was sent to 2885 international students in doctoral programs. The students had neither a permanent resident status nor U.S. citizenship (all visa types). I received 427 completed surveys or a 15% response rate, as the initial target, which was set before the IDSES administration. Out of 427 participants, 23.4% of the doctoral students (n=100) were from Iowa State University, 30.4% of the doctoral students (n=130) were from Kansas State University, 3.3% of the doctoral students (n=14) were from North Dakota State Universtiy, 21.8% of the doctoral students (n=93) were from the University of Kansas, 1.9% of the doctoral students (n=8) were from the University of Missouri-Kansas City, and 15.5% of the doctoral students (n=66) were from the University of Nebraska-Lincoln.. Nearly 4% (n=16) participants did not specify their institution.

Table 1

Frequencies and Percentages for Survey Respondents' Universities

University	Frequency	Percentage %
Iowa State University	100	23.4
K-State University	130	30.4
North Dakota State University	14	3.3
University of Kansas	93	21.8
University of Missouri-Kansas City	8	1.9
University of Nebraska	66	15.5
Total	427	100.0

The second question on the demographic information asked the survey respondents to specify the type of the doctoral program they were enrolled in at the time of the survey completion. The data suggested that 2.8% (n=12) of the participants were enrolled in EdD programs while 93.7% (n=400) of the participants were enrolled in PhD programs. The remaining (3.5%) students did not respond to this question.

In the third question on the demographic information, the participants were asked to specify the stage of the doctoral program they were enrolled in at the time of the survey completion. The data revealed that most of the survey respondents were in the first stage of their doctoral education, that is to say, they were taking courses at the time of the survey completion. One third of the survey respondents had passed their comprehensive exams and were in the process of writing their doctoral dissertation.

Table 2

Frequencies and Percentages for Stage in Doctoral Program

	Frequency	Percentage %
Taking courses	181	42.8
Finished all coursework requirements, preparing for comprehensive exams	100	23.6
Passed comprehensive exams and writing doctoral dissertation	142	33.6
Total	423	100.0
Missing	4	
Total	427	

Frequencies and percentages were also examined for the international doctoral students' country of origin. The results of the descriptive analysis revealed that out of the total amount of respondents, 22.7% (*n*=97) of the students were from China, 20.6% (*n*=88) of the students were from India, and 5.2% (*n*=22) were from Saudi Arabia. The remaining 51% of the students were from different countries.

The majority of the international doctoral students in six research universities did not receive any other academic degree from their current institution.

Table 3

Frequencies and Percentages for Another Academic Degree from Current Institution

		Frequency	Percentage %
	No	330	77.3
	Yes	88	20.6
	Total	418	97.9
Missing	System	9	2.1
Total		427	100.0

Control variables

Descriptive statistics were also computed for the financial support provided to the international doctoral students in the six research universities participating in this research (Table 1), revealing that the majority of the survey respondents (59.2%, *n*=251) had either a research asssistanship or a teaching assistantship. Only a small population (6%, *n*=26) of the students had a scholarship or grant as a financial support, and almost one tenth of the respondents (9.4%, n=40) had no financial support from their universities.

Table 4

Frequencies and Percentages for Financial Support

Financial Support	Frequency	Percentage %
I have not been provided any financial support	40	9.4
Research assistantship	158	37.0
Research assistantship and scholarship	23	5.4
Scholarship or grant	25	5.9
Teaching assistantship	95	22.2
Teaching assistantship, research assistantship	66	15.5
Teaching assistantship and scholarship	12	2.8
Total	427	100.0

As noted in Table 5, less than one-fourth of the participants attended another U.S. institution. The mean amount of time that the international doctoral students spent in their doctoral program at the time of the survey completion was 2.64 years. As shown in the Appendix D, 27.1% of the students had spent 1 year or less in their doctoral program, while 4.5% of the students had been in the program for more than 5 years. The majority of the survey respondents were in their programs for more than 1 year but less than 5 years.

Table 5

Frequencies and Percentages for Attendance of another U.S. Institution

		Frequency	**Percentage %**
	No	324	77.5
	Yes	94	22.5
	Total	418	100.0
Missing	System	9	
Total		427	

Independent variables

Means and SDs

In order to learn the extent to which the international doctoral students were engaged in academic and social activities during their doctoral study, means and standard deviations were computed for 11 independent variables. The programmatic emphasis on studying (M=3.49, SD=0.69) and supportive campus environment (M=2.52, SD=0.51) had the highest means, while student-faculty interaction (M=1.19, SD=0.57), participation in extracurricular activities (M=1.05, SD=0.84), attendance at various events (M=1.03, SD= 0.85), and the usage of technology (M=1.20, SD=0.93) had the lowest means. Students working hard to meet their class instructors' course requirements (M=1.82, SD=0.80), participation in co-curricular activities (M=1.58, SD=0.99), and active and collaborative learning (M=1.55, SD=0.58) had average means. Table 6 describes the means and standard deviations for the independent variables.

Table 6

Means and Standard Deviations for Academic and Social Engagement

Academic and Social Engagement	Mean	SD	N
Active and collaborative learning	1.55	0.58	423
Student-faculty interaction	1.19	0.57	421
Supportive campus environment	2.52	0.51	423
Participation in co-curricular activities	1.58	0.99	410
Participation in extra-curricular activities	1.05	0.84	410
Attendance of various events	1.03	0.85	413
Technology usage	1.20	0.93	395
Time spent on academic work	46.74	22.221	423
Working hard on course requirements	1.82	0.80	423
Programmatic emphasis on studying	3.49	0.69	416
Programmatic emphasis on socializing	2.0	0.69	417

Descriptive analysis was performed to examine the extent to which the international doctoral students engage in academic and social activities in the six research universities. The following section reports more detailed results for the frequency distributions, means, and standard deviations for the eleven independent variables in the study.

Active and collaborative learning

The data suggested that over half the sample of doctoral international students (58.4%, *n*=247) *sometimes* worked actively with other students. Almost one third of the respondents (28.1%, *n*=119) *never* practiced active and collaborative learning, while only a small population (13.5%, *n*=57) of the international doctoral students asked questions in class or contributed to class discussions, worked actively with other students on projects during class, and/ or worked with classmates outside of class to prepare class assignments (Appendix E).

Student-faculty interaction

The results of the descriptive data analysis showed that the international doctoral students in six research universities had very limited interactions with faculty at their academic departments. One third of the participants (74.5%, *n*=318) *never* discussed their grades or assignments with their course instructors, and one fifth of the participants (21.5%, *n*=92) *sometimes* discussed their grades or assignments with their course instructors. A small population of the respondents (4%, *n*=17) *often* discussed their grades or assignments with faculty. A similar trend was obtained with regards to discussing ideas from readings or classes with faculty members outside of class. Most of the doctoral students (68.2%, n=288) never discussed ideas from readings or classes with faculty members outside of class, while 25.9% of

the students (n=110) only sometimes interacted with the faculty in this regards. A very small percentage of the doctoral students (5.9%, n=25) reported that they discussed the ideas from readings or classes with faculty members outside of class. More than half (58%, *n*=238) of the respondents *never* talked about their career plans with a faculty member or advisor, while one third (31%, *n*=128) have done so *sometimes*. Simlarly, one third of the respondents (73.1%, *n*=303) *never* worked with faculty members on activities other than coursework such as committee, orientation, or student life activities. Two thirds of the respondents (66%, *n*=274) *never* worked on a project with a faculty member outside of course or program requirements, while one third (34%, *n*=141) worked from *sometimes* to *often* with their faculty members on a project outside of the course requirements. A complete list of frequencies and percentages of the data analysis on the student-faculty interaction is appended (Appendix F).

Supportive campus environment

The international doctoral students in six research universities in this study responded to the question of a supportive campus environment for their doctoral study. Half of the international doctoral students indicated that they had a *good* to *excellent* relationship with other students (55%, *n*=316) and their faculty (53%, *n*=216) at their universities; however, these numbers drop to 46% for international doctoral students' relationships with American students. More than half of the respondents (54%, *n*=223) indicated *poor* to *average* quality of relationships with American students. Almost one third of the international doctoral students rated their relationships with administrative personnel and staff at their academic departments as *average* to *good* (76%, *n*=319). However, a small population of the students had *poor* (10%, *n*=43) or *excellent* (13%, *n*=55) relationships with administrative personnel and staff at their

academic departments where they were pursuing their doctoral degree. A complete list of frequencies and percentages of the students' responses to the questions on the supportive campus environment is provided in the Appendix G.

Participation in co-curricular activities

Descriptive results of the data analysis showed that 34.1% (*n*=140) of the survey respondents *sometimes* participated in co-curricular activities related to their academic programs (teaching/research assistantship, academic organizations, campus publications, etc), while 29% (*n*=119) of the respondents participated *often* and 22% (*n*=90) participated *very often* in such kind of activities. However, a small percentage of the respondents (14.9%, *n*=61) *never* participated in co-curricular activities.

Table 7

Frequencies and Percentages for Participated in Cocurricular Activities

	Frequency	**Percentage %**
Never	61	14.9
Sometimes	140	34.1
Often	119	29.0
Very often	90	22.0
Total	410	100.0
Missing	17	
Total	427	

Participation in extra-curricular activities

The results of the data analysis suggests that the majority (72.5%, *n*=297) of the international doctoral students *never* (27.6%, *n*=113) or *sometimes* (44.9%, *n*=184) engaged in extra-curricular activities such as participating in campus groups, clubs, or student organizations

that were not related to their academic programs. Only a small population of students (5.1%, *n*=21) *very often* participated in extra-curricular activities.

Table 8

Frequencies and Percentages for Participated in Extra-curricular Activities

	Frequency	**Percentage %**
Never	113	27.6
Sometimes	184	44.9
Often	92	22.4
Very often	21	5.1
Total	410	100.0
Missing	17	
Total	427	

Attendance at various events

Almost half of the international doctoral students (47%, *n*=194) *sometimes* attended various social events such as art exhibits, dance, music, theater, and other performances, while 28.1% of the students *never* attended such events.

Table 9

Frequencies and Percentages for Attended Non-academic Activities (Art exhibit)

	Frequency	**Percentage %**
Never	116	28.1
Sometimes	194	47.0
Often	76	18.4
Very often	27	6.5
Total	413	100.0
Missing	14	
Total	427	

Technology usage

One forth the international doctoral students *never* (24.3%, *n*=96) used technology, while only 10.6% student *very often* used technology. The majority of the respondents (65.1%, *n*=257) used technology *often* to *sometimes*.

Table 10

Frequencies and Percentages for Technology Usage

	Frequency	Percentage %
Never	96	24.3
Sometimes	167	42.3
Often	90	22.8
Very often	42	10.6
Total	395	100.0
Missing	32	
Total	427	

Time spent on academic work

The results of the descriptive analysis revealed that the majority of the international doctoral students (80.6%, *n*=344) spent at least 60 hours per week doing academic work (studying, reading, writing, doing lab work, analyzing data, and other academic activities). The data also revealed that a small number of students (2%, *n*=9) spent a significant amount of time (>100 hrs per week) on doing the academic work. A complete list of the analyzed data on the time the students spent on doing academic work is appended (Appendix H).

Working hard to meet instructors' course requirements

The results of the descriptive statistics showed that over half of the sample of the international doctoral students (62.4%, *n*=264) *often* worked harder than expected to meet their

instructors' course requirements. Only a small population (2.6%, *n*=11) *never* worked hard, and 35% of the students *sometimes* worked hard to meet their instructors' course requirements.

Table 11

Frequencies and Percentages for Work Hard to Meet Course Requirements

	Frequency	**Percentage %**
Never	11	2.6
Sometimes	148	35.0
Often	171	40.4
Very often	93	22.0
Total	423	100.0
Missing	4	
Total	427	

Programmatic emphasis on studying

The results of the descriptive analysis indicates that the majority (91.1%, n=379) of the international doctoral students felt that their academic programs put an emphasis on studying to the extent of *some* to *very much*, while a small population of the respondents (8.9%, n=37) felt that there was little programmatic emphasis on studying.

Table 12

Frequencies and Percentages for Academic Emphasis on Studying

	Frequency	**Percentage %**
Never	6	1.4
Sometimes	31	7.5
Often	132	31.7
Very often	247	59.4
Total	416	100.0
Missing	11	
Total	427	

Programmatic emphasis on socializing

Two thirds (72%, n=300) of the doctoral international students responded that their academic program *provided little or no* support to socialize with other people. Only 24.7% of the respondents (*n*=103) felt *some* emphasis on socializing with people.

Table 13

Frequencies and Percentages for Academic Emphasis on Socializing

	Frequency	**Percentage %**
Never	130	31.2
Sometimes	170	40.8
Often	103	24.7
Very often	14	3.4
Total	417	100.0
Missing	10	
Total	427	

Dependent variables

Frequencies, percentages, means, and SDs

In order to measure self-reported academic gains of the international doctoral students, means and SDs were computed for six dependent variables. The IDSES asked the students to rate their acquisition of academic knowledge and skills in their doctoral area of study; writing clearly and effectively; presenting research at conferences, seminars, and workshops; publishing research in scholarly journals; career preparation (preparation for professional role, job search, decision in career plans); and satisfaction with academic gains. The answers to the seven academic gains were measured with a response choice on a scale of 1-4 (poor-excellent), and the answers to the question on satisfaction with academic gains were measured on a scale of 1-4 (not satisfied-very satisfied).

The results of the IDSES revealed that almost half of the international doctoral students (43.5%, *n*=182) rated their academic gains in the acquisition of academic knowledge and skills in their doctoral area as *good*. Additionally, 9.3% (*n*=39) of the international doctoral students evaluated their knowledge acquisition as *excellent.*

Table 14

Frequencies and Percentages for Gain in Acquisition of Academic Knowledge and Skills

		Frequency	**Percentage %**
	Poor	15	3.7
	Average	182	43.5
	Good	182	43.5
	Excellent	39	9.3
	Total	418	100.0
Missing	System	9	2.1
Total		427	100.0

Half of the international doctoral students (54.1%, *n*=223) rated their academic gain in writing clearly and effectively as *good to excellent.*

Table 15

Frequencies and Percentages for Academic Gain in Writing Clealry and Effectively

		Frequency	**Percentage %**
	Poor	27	6.3
	Average	162	37.9
	Good	167	39.1
	Excellent	56	13.1
	Total	412	96.5
Missing	System	15	3.5
Total		427	100.0

The majority of the international doctoral students rated their academic gain in presenting doctoral research as *average* to *good* (76.3%, *n*=305). However, one fifth of the international doctoral students (19.3%, *n*=80) felt that they did not have much academic gain in presenting and publishing research, as they rated it *as poor.*

Table 16

Frequencies and Percentages for Presentation of Research

		Frequency	**Percentage %**
	Poor	44	10.3
	Average	148	34.7
	Good	157	36.8
	Excellent	65	15.2
	Total	414	97.0
Missing	System	13	3.0
Total		427	100.0

Table 17

Frequencies and Percentages for Publishing Research

		Frequency	**Percentage %**
	Poor	80	18.7
	Average	163	38.2
	Good	130	30.4
	excellent	41	9.6
	Total	414	97.0
Missing	System	13	3.0
Total		427	100.0

The majority of the international doctoral students (71.9%, *n*=307) evaluated their program's role in preparing them for a future career as *average* to *good*.

Table 18

Frequencies and Percentages for Career Preparation

		Frequency	Percentage %
	Poor	80	18.7
	Average	179	41.9
	Good	128	30.0
	excellent	29	6.8
	Total	416	97.4
Missing	System	11	2.6
Total		427	100.0

Overall, the data revealed that 42.6% (*n*=178) and 38% (*n*=159) of the international doctoral students were *satisfied* and *somewhat satisfied* in their academic gains during their doctoral education. Only small number of the international doctoral students were *very satisfied* (12.9%, *n*=54) or *not satisfied* at all (6.5%, *n*=27) in their academic achievement.

Table 19

Frequencies and Percentages for Satisfaction with Academic Gains

		Frequency	Percentage %
	not satisfied	27	6.3
	Somewhat	159	37.2
	satisfied		41.7
	Satisfied	178	12.6
	Very satisfied	54	97.9
	Total	418	2.1
Missing	System	9	100.0
Total		427	

Overall, the students' academic gain in the acquisition of academic knowledge and skills had the highest mean (*M*=2.85, *SD*=0.62) among all academic gains of the international doctoral

students. The international students' ability to write clearly and effectively (*M*=2.61, *SD*=0.80) and their academic gains in presenting research (*M*=2.59, *SD*=0.87) had average means. The international students' academic gain in publishing their research in scholarly journals (*M*=2.32, *SD*=0.89) and their career preparation for a professional role, job search, and making decisions in career plans (*M*=2.26, *SD*=0.86) had low to average means. The overall satisafaction with their academic gains (*M*=1.64, *SD*=0.81) had the lowest means.

Table 20

Means (M) and Standard Deviations (SD) for Self-reported Academic Gains

Dependent variables	Mean	SD	N
Acquisition of knowledge and academic skills	2.85	0.62	418
Clear and effective writing	2.61	0.80	412
Presentation of research	2.59	0.87	414
Research publication	2.32	0.89	414
Career preparation	2.26	0.85	416
Satisfaction with academic gains	1.62	0.79	418

1=Poor; 2=Average; 3=Good; 4=Excellent

Correlations

In order to examine the strength of the associations between independent and dependent variables, bi-variate correlations were computed. IDSES data analysis results showed statistically significant correlations between the independent and dependent variables ($p<0.05$). The independent variables such as active and collaborative learning and participation in co-curricular activities were found to be strongly correlated with all six dependent variables. A significant correlation was observed between student-faculty interaction and acquisition of academic knowledge and skills, presenting research, publishing research, career preparation, and satisfaction with academic gains. The supportive campus environment had a strong correlation

with all dependent variables except for writing clearly and effectively. Participation in extra-curricular activities was found to be correlated with only one depdndent variable: publishing research. The attendance to various non-study related events was correlated with the dependent variables: presenting research, publishing research, and satisfaction with academic gains. The use of technology was correlated with publishing research and career preparation. The time for academic work was found to be correlated with international doctoral students' gains in knowledge acqusition in their doctoral area, academic gains in writing clearly and effectively, and publishing research. The emphasis of academic program on studying correlated with acquiring academic knowledge and skills. The academic program's emphasis on socializing had a correlation with the dependent variables: presenting research, publishing research, and career preparation. The control variable, time in program, had significant correlations with the students' ability to present and publish research and overall satisfaction with their academic gains. Also, international doctoral students' attendance at another U.S. college was found to have significant correlation with their ability to write clearly and effectively. The control variable, teaching assistanship (TA) correlated significantly with the dependent variable, acquisition of knowledge and academic skills, while having a teaching assistantship combined with research assistantship (RA) correlated with the dependent variables acquisition of knowledge and academic skills and presenting research. The control variable, RA, combined with scholarship grant was shown to have a signficant correlation with acquisition of knowledge and academic skills, writing clearly, career preparation, and overall satisfaction with academic gains. Also, the control variable, TA, combined with scholarship grant had a significant correlation with international students' overall satisfaction with their academic gains.

Table 21

Pearson Correlation Coefficients for Independent and Dependent Variables

	Knowledge acquisition & academic skills	Clear and effective writing	Presentation of research	Publication of research	Career preparation	Satisfaction with academic gains
RA	-0.048	-0.057	-0.032	-0.026	-0.023	0.003*
TA	-0.127*	-0.027	-0.072	0.004	0.007	-0.077
Scholarship	0.075	0.048	0.001	-0.034	-0.038	-0.047
RA + TA	0.092*	0.060	0.148*	0.070	0.019*	0.032*
RA + Schol	0.173*	0.088*	0.053	-0.008	0.094	0.117
TA + Schol	0.073	-0.034	0.031	0.044	-0.037	0.122
TIP	0.339	0.102	0.135*	0.144*	0.038	0.099*
AUC	0.014	0.116*	0.020	-0.067	0.052	0.052
ACL	0.257*	0.155*	0.181*	0.220*	0.202*	0.158*
SFI	0.108*	0.078	0.236*	0.234*	0.225*	0.117*
SCE	0.215*	0.229*	0.301*	0.258*	0.258*	0.316*
PCA	0.191*	0.047	0.240*	0.203*	0.133*	0.202*
PEA	-0.003	0.029	0.077	0.099*	0.063	0.013
AVE	0.006	0.089	0.142*	0.090*	0.072	0.114*
TU	-0.002	0.086	0.085	0.096*	0.086	0.061
TAW	0.109*	0.041	0.117*	0.152*	0.064	0.031
WHC	0.020	0.026	0.033	-0.064	0.022	-0.005
PES	0.190*	0.064	0.023	0.026	0.049	0.079
PESoc	-0.077	0.062	0.106*	0.177*	0.018*	0.073

TIP – Time in program; DCU – Other degree from current university; AUC – Attended another U.S. college; ACL- Active and collaborative learning; SFI – Student-Faculty interactions; SCE – Supportive campus environment; PCA – Participation in co-curricular activities; PEA – Participation in extra-curricular activities; AVE – Attendance of various events; TU – Technology usage; TAW – Time spent on academic work; WHS – Working hard to meet instructors' course requirements; PES – Programmatic emphasis on studying; PESoc – Programmatic emphasis on socializing
*values significant at $p<0.05$

Regression analysis

Multiple linear regression analysis was conducted to examine a relationship between engagement and self-reported academic gains of international doctoral students. Regression analysis was performed while controlling for the financial support (TA, RA, scholarship, TA combined with RA, TA combined with scholarship and RA combined with scholarhsip), time in program, and attendance at another U.S. institution.

Regression for dependent variable 1: Acquisition of academic knowledge and skills

In order to find out if international students' engagement in academic and social activities was related to the acquisition of academic knowledge and skills during the students' doctoral study, a multiple linear regression analysis was conducted. There was a significant relationship ($R=0.458$, $R^2= 0.209$, F (11, 413) $=4.779$, $p<0.01$) between engagement in academic and social activities (combined together) and the acquisition of academic knowledge and skills. The results showed that engagement in academic and social activities accounted for 14% of variance in the acquisition of academic knowledge and skills.

Engagement in academic and social activities were each separately examined for independent contributions to the change in the acquisition of academic knowledge and skills. The independent variables, active and collaborative learning ($B= 0.194$, $p=0.001$), the supportive

campus environment (B=0.221, *p*=0.001), usage of technology (B= -0.087, *p*=0.018), academic emphasis on studying ((b=0.138, p=0.003)), and programmatic emphasis on socializing (B= 0.096, *p*=0.016) had a significant relationship with the acquisition of academic knowledge and skills. The financial support in the form of scholarships and scholarship combined with RA were found to have a significant impact (B=0.429, *p*=0.007 and b=0.440, *p*=0.007 respectively) on the acquisition of academic knowledge and skills among international doctoral students.

Table 22a

Regression Analysis, Coefficients and Collinearity Statistics for Knowledge Acquisition

Variables	Unstandardized coefficients	Standardized coefficients	Sig.	Collinearity	
	B	Beta		Tolerance	VIF
Control variables					
Research assistantship	0.181	0.142	0.118	0.280	3.568
Teaching assistantship	0.048	0.032	0.695	0.340	2.945
Scholarship or grant	0.429	0.170	0.007*	0.582	1.719
RA and TA	0.248	0.149	0.064	0.360	2.775
RA and scholarship	0.440	0.174	0.007*	0.564	1.773
TA and scholarship	0.363	0.105	0.066	0.706	1.417
Time in program	-0.004	-0.003	0.951	0.782	1.278
Attended another US college	0.034	0.024	0.660	0.794	1.259
Independant variables					
Active and collaborative learning	0.194	0.183	0.001*	0.743	1.347
Student-faculty interaction	0.054	0.051	0.398	0.638	1.568
Supportive campus environment	0.221	0.188	0.001*	0.697	1.434
Participation in co-curricular activities	0.057	0.093	0.091	0.768	1.303
Participation in extra-curricular activities	-0.041	-0.056	0.295	0.807	1.238
Attendance of various events	-0.014	-0.020	0.715	0.805	1.242
Technology usage	-0.087	-0.132	0.018*	0.750	1.334

Time spent on academic work	0.001	0.051	0.311	0.910	1.099
Working hard to meet instructors' course requirements	0.000	0.000	0.994	0.896	1.117
Programmatic emphasis on studying	0.138	0.152	0.003*	0.911	1.098
Programmatic emphasis on socializing	-0.096	-0.131	0.016*	0.779	1.284

*values significant at p<0.05

Table 22b

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0.27	0.073	0.052	0.599	0.073	3.480	8
2	0.458	0.209	0.166	0.563	0.136	5.380	11

Regression for dependent variable 2: Writing clearly and effectively

Combined independent variables on student engagement were found to be significantly related to the students' academic gain in writing clearly and effectively (R=0.295, R^2=0.087, *F* (11, 414)=1.750, *p*<0.05) during their doctoral study. According the multiple linear regression results, student engagement accounted for 6% of variance in this dependent variable (R^2 change =0.63). The independent variable, supportive campus environment (b=0.302, B=0.205, *p*=0.001), was the only type of engagement that had a significant relationship with writing clearly and effectively among the international doctoral students. The control variable of attending another U.S. college (b=0.211, B=0.115, *p*=0.032) was also found to be significantly related to the students' writing clearly and effectively.

Table 23a

Regression Analysis, Coefficients and Collinearity Statistics for Writing Clearly and Effectively

Variables	Unstandardized coefficients	Standardized coefficients	Sig.	Collinearity	
	B	beta		Tolerance	VIF
Control variables					
Research assistantship	0.025	0.015	0.874	0.295	3.395
Teaching assistantship	0.039	0.021	0.814	0.359	2.784
Scholarship or grant	0.148	0.047	0.492	0.606	1.650
RA and TA	0.094	0.045	0.603	0.398	2.512
RA and scholarship	0.241	0.075	0.276	.615	1.626
TA and scholarship	-0.122	-0.028	0.646	0.739	1.353
Time in program	0.184	0.112	0.056	0.783	1.278
Attendance of another U.S. college	0.077	0.042	0.467	0.794	1.260
Independant variables					
Active and collaborative learning	0.109	0.083	0.170	0.740	1.351
Student-faculty interaction	-0.057	-0.043	0.215	0.634	1.578
Supportive campus environment	0.302	0.205	0.001*	0.692	1.444
Participation in co-curricular activities	-0.028	-0.306	0.544	0.763	1.310
Participation in extra-curricular activities	-0.030	-0.033	0.568	0.807	1.239
Attendance of various events	0.044	0.049	0.401	0.803	1.245
Technology usage	0.021	0.025	0.673	0.749	1.335
Time spent on academic work	0.001	0.040	0.458	0.911	1.098
Working hard to meet instructors' course requirements	0.032	0.034	0.535	0.896	1.116
Programmatic emphasis on studying	0.065	0.057	0.294	0.914	1.094
Programmatic emphasis on socializing	0.013	0.014	0.810	0.777	1.287

*values significant at $p<0.05$

Table 23b

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0.161	0.026	0.004	0.772	0.026	1.171	8
2	0.298	0.089	0.038	0.759	0.063	2.141	11

Regression for dependent variable 3: Presenting research

Student engagement in academic and social activities, combined together, was significantly related to the academic gain in presenting research (R=0.426, R^2=0.181, *F* (11, 414)=3.976, *p*<0.001).) among the students. The change in R^2 values from 0.053 to 0.129 indicated that student engagement contributed for 13% of the variance in the students' presenting their research during the doctoral study. Three out of the eleven independent variables, supportive campus environment (b=0.335, B=0.201, *p*=0.001), participation in co-curricular activities (b=0.102, B=0.117, *p*=0.038) ,and time spent on academic work (b=0.004, B=0.112, *p*=0.030), were significantly related to the development of one of the research skills, presenting research among the students. Interestingly, a control variable, time in program (b=0.246, B=0.134, *p*=0.016), was found to be a significant contributor to the international doctoral students' ability to presenting research during their doctoral education. However, contributions from other control variables, attendance at another U.S. college (b=0.203, B=0.099, *p*=0.072) and financial assistance (RA, TA, and scholarships) were not significant for international students' ability to present reseach. The IDSES analysis revealed that a supportive campus environment was the type of engagement that had the strongest relationship with this skill.

Table 24a

Regression Analysis, Coefficients and Collinearity Statistics for Presenting Research

Variables	Unstandardized coefficients	Standardized coefficients	Sig.	Collinearity	
	B	beta		Tolerance	VIF
Control variables					
Research assistantship	0.146	0.081	0.380	0.294	3.401
Teaching assistantship	0.001	0.000	0.997	0.359	2.786
Scholarship or grant	0.242	0.068	0.290	0.606	1.650
RA and TA	0.283	0.121	0.140	0.398	2.513
RA and scholarship	0.172	0.048	0.458	0.603	1.657
TA and scholarship	0.161	0.033	0.568	0.739	1.353
Time in program	0.246	0.134	0.016*	0.782	1.279
Attendance of another U.S. college	0.203	0.099	0.072	0.793	1.261
Independant variables					
Active and collaborative learning	0.052	0.035	0.543	0.740	1.351
Student-faculty interaction	0.146	0.098	0.113	0.634	1.577
Supprotive campus environment	0.335	0.201	0.001*	0.692	1.444
Participation in co-curricular activities	0.102	0.117	0.038*	0.765	1.308
Participation in extra-curricular activities	-0.050	-0.048	0.376	0.808	1.238
Attendance of various events	0.069	0.069	0.209	0.804	1.243
Technology usage	-0.034	-0.037	0.515	0.749	1.335
Time spent on academic work	0.004	0.112	0.030*	0.911	1.098
Working hard to meet instructors' course requirements	0.048	0.045	0.381	0.895	1.118
Programmatic emphasis on studying	0.026	0.020	0.693	0.914	1.094
Programmatic emphasis on socializing	0.049	0.047	0.395	0.777	1.287

*values significant at $p<0.05$

Table 24b

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0.229	0.053	0.031	0.856	0.053	2.441	8
2	0.426	0.181	0.136	0.808	0.129	4.877	11

Regression for dependent variable 4: Publishing research

The results of the multiple linear regression showed that students' engagement in academic and social activities was significantly related to the academic gain in publishing research ((R=0.419, R^2=.0.176, F (11, 414)=3.818, p<0.001)) among the international doctoral students. Independent contribution of each type of engagement was as following: active and collaborative learning (b=0.190, B=0.125, p=0.030), supportive campus environment (b=0.218, B=0.128, p=0.031), time spent on academic work (b=0.007, B=0.178, p=0.001), and programmatic emphasis on socializing (b=0.140, B=0.133, p=0.018) were significantly related to the students' ability to publish their research. The time in program (b=0.307, B=0.163, p=0.004), a control variable, had a significant effect on publishing research during the students' doctoral education. Time spent on academic work was found to have the strongest effect on the international doctoral students' ability to publish their research. The change in R^2 values from 0.030 to 0.146 indicated that the independent variables contributed 15% of the variance in publishing research.

Table 25a

Regression Analysis, Coefficients and Collinearity Statistics for Publishing Research

Variables	Unstandardized coefficients	Standardized coefficients	Sig.	Collinearity	
	B	Beta		Tolerance	VIF
Control variables					
Financial_RA	0.002	0.001	0.989	0.295	3.396
Financial_TA	0.023	0.011	0.900	0.359	2.784
Financial_scholar_grant	0.018	0.005	0.938	0.606	1.650
Financial_TA_RA	-0.080	-0.033	0.685	0.401	2.495
Financial_RA_scholar	-0.205	-0.056	0.391	0.604	1.657
Financial_TA_scholar	0.117	0.024	0.686	0.739	1.353
Time in program	0.307	0.163	0.004*	0.783	1.278
Attendance of another U.S. college	-.168	-.079	0.117	.957	1.045
Independant variables					
Active and collaborative learning	0.190	0.125	0.030*	0.740	1.351
Student-faculty interaction	0.111	0.072	0.243	0.633	1.581
Supportive campus environmet	0.218	0.128	0.031*	0.693	1.442
Participation in co-curricular activities	0.086	0.097	0.087	0.765	1.307
Participation in extra-curricular activities	-0.004	-0.004	0.942	0.805	1.242
Attendance of various events	0.008	0.008	0.886	0.804	1.243
Technology usage	-0.014	-0.015	0.789	0.748	1.336
Time spent on academic work	0.007	0.178	0.001*	0.911	1.097
Working hard to meet instructors' course requirements	-0.097	-0.089	0.087	0.892	1.120
Programmatic emphasis on studying	0.030	0.23	0.658	0.914	1.094
Programmatic emphasis on socializing	0.140	0.133	0.018*	0.777	1.286

*values significant at $p<0.05$

Table 25b

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0.173	0.030	0.008	0.886	0.030	1.361	8
2	0.419	0.176	0.130	0.830	0.146	5.467	11

Regression for dependent variable 5: Career preparation

In order to find out if student engagement in academic and social activities was related to career preparation of international doctoral students, multiple linear regression analysis was conducted. There was a significant relationship (R=0.336, R^2= 0.113, F (11, 416) =2.286, p<0.01) between engagement in academic and social activities, combined together, and career preparation. The results showed that engagement in academic and social activities accounted for 10% of variance in career preparation of international students in doctoral programs.

According to the results, the independent contributions by supportive campus environment (b=0.293, B=0.178, p=004*)* were statistically significant. Even though financial assistance in the form of an RA combined with scholarships has a strong correlation with students' career preparation, no significant impact of financial assistance in forms of TA, RA ,and scholarships were observed. The change for R^2 was 0.098, indicating that student engagement in academic and social activities accounted for 10% of the variability in career preparation. Supportive campus environment, once again, was found to be the strongest contributor, followed by student-faculty interaction.

Table 26a

Regression Analysis, Coefficients and Collinearity Statistics for Career Preparation

Variables	Unstandardized coefficients	Standardized coefficients	Sig.	Collinearity	
	B	Beta		Tolerance	VIF
Control variables					
Financial_RA	0.010	0.006	0.952	0.294	3.401
Financial_TA	0.016	0.008	0.929	0.357	2.804
Financial_scholar_grant	-0.108	-0.031	0.646	0.606	1.650
Financial_TA_RA	-0.042	-0.018	0.831	0.400	2.497
Financial_RA_scholar	0.194	0.055	0.418	0.603	1.657
Financial_TA_scholar	-0.230	-0.048	0.429	0.739	1.353
Time in program	0.071	0.039	0.502	0.777	1.287
Attendance of another U.S. college	0.096	0.048	0.407	0.791	1.264
Independant variables					
Active and collaborative learning	0.143	0.097	0.102	0.742	1.347
Student-faculty interaction	0.168	0.114	0.077*	0.635	1.576
Supprotive campus environment	0.293	0.178	0.004*	0.699	1.430
Participation in co-curricular activities	0.028	0.032	0.580	0.771	1.296
Participation in extra-curricular activities	-0.030	-0.29	0.609	0.812	1.232
Attendance of various events	-0.004	-0.004	0.946	0.806	1.241
Technology usage	-0.014	-0.015	0.802	0.742	1.348
Time spent on academic work	0.002	0.051	0.344	0.909	1.100
Working hard to meet instructors' course requirements	0.020	0.019	0.720	0.895	1.118
Programmatic emphasis on studying	0.058	0.046	0.391	0.911	1.098
Programmatic emphasis on socializing	0.043	0.042	0.468	0.784	1.275

*values significant at $p<0.05$

Table 26b

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0.121	0.015	-0.008	0.8639	0.015	0.648	8
2	0.36	0.113	0.064	0.8327	0.098	3.441	11

Regression for dependent variable 6: Satisfaction with academic gains

The combined independent variables of student engagement were found to be significantly related to students' satisfaction with academic gains (R=0.418, R^2=0.175, *F* (11, 418)=3.822, *p*<0.001) during their doctoral study. The change of 0.134 in the R^2 values (from 0.065 to 0.110), suggested that the independent variables contributed to 11% of the variability in the dependent variable of satisfaction with academic gains.

The independent variable, a supportive campus environment (b=0.422, B=0.274, *p*=0.000), was the only type of student engagement that had significant relationships with the students' satisfaction with their academic gains. The financial assistance in forms of RA (b=0.335, B=0.201, *p*=0.0.031), scholarships (b=0.491, B=0.148, *p*=0.022), RA combined with scholarships (b=0.499, B=0.151, *p*=0.022) and TA combined with scholarships (b=0.739, B=0.164, *p*=0.005) had a significant impact on international students' overall satisfaction with their academic gains. Once again, a supportive campus environment was found to be the strongest contributor among the eleven types of student engagement in academic and social activities.

Table 27a

Regression Analysis, Coefficients and Collinearity Statistics for Satisfaction with Academic Gains

Variables	Unstandardized coefficients	Standardized coefficients	Sig.	Collinearity	
	B	beta		Tolerance	VIF
Control variables					
Research assistantship	0.335	0.201	0.031*	0.293	3.417
Teaching assistantship	0.193	0.099	0.240	0.356	2.808
Scholarship or grant	0.491	0.148	0.022*	0.606	1.650
RA and TA	0.228	0.104	0.203	0.398	2.515
RA and scholarship	0.499	0.151	0.022*	0.603	1.658
TA and scholarship	0.739	0.164	0.005*	0.739	1.354
Time in program	0.164	0.096	0.083	0.782	1.278
Attendance of another U.S. college	0.143	0.075	0.174	0.794	1.259
Independant variables					
Active and collaborative learning	0.072	0.052	0.363	0.743	1.347
Student-faculty interaction	-0.018	-0.013	0.835	0.638	1.568
Supprotive campus environment	0.422	0.274	0.000*	0.697	1.434
Participation in co-curricular activities	0.081	0.100	0.076	0.768	1.303
Participation in extra-curricular activities	-0.079	-0.082	0.132	0.807	1.238
Attendance of various events	0.066	0.070	0.200	0.805	1.242
Technology usage	-0.024	-0.028	0.618	0.750	1.334
Time spent on academic work	0.001	0.026	0.612	0.910	1.099
Working hard to meet instructors' course requirements	0.002	0.002	0.976	0.896	1.117
Programmatic emphasis on studying	0.081	0.068	0.189	0.911	1.098
Programmatic emphasis on socializing	-0.005	-0.005	0.929	0.779	1.284

*values significant at $p<0.05$

Table 27b

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0.255	0.065	0.044	0.790	0.065	3.067	8
2	0.418	0.175	0.129	0.754	0.110	4.153	11

Summary

The data analysis collected from the IDSES revealed that there were statistically significant correlations between student engagement in academic and social activities and the self-reported academic gains among the international doctoral students in six research universities.

The survey results found that the survey respondents reported that their program's emphasis on studying was high. Moderate level of supportive campus environement and programmatic emphasis on socializing was reported. Majority of the particpants worked hard to meet instructors' course requirements. The level of remaining social and academic engagement activities--participation in co-curricular activities, active and collaborative learning, use of technology, participation in extra-curricular activities, and attendance at various events--were reported low.

Bivariate correlations demonstrated that some types of student engagement correlated better with different academic gains than others did. The active and collaborative learning and supportive campus environment had statistically significant correlation with all of the six self-reported academic gains of the international students in doctoral programs. Participation in co-curricular activities and student-faculty interaction correlated significantly with the international doctoral student's ability to acquire academic knowledge and skills, presenting a research,

publishing a research, career preparation, and satisfaction with academic gains. The use of technology, participation in extra-curricular activities and attendance at various events had significant correlations with the students' ability to publish their research. The time spent on academic work had a significant correlation with the dependant variables, acquisition of academic knowledge and skills, ability to presenting research and ability to publishing research. The international doctoral students perceived the independent variable of working hard to meet instructors' course requirements as having no significant correlations with any of the eleven academic gains. The programmatic emphasis on studying had significant correlation with acquisition of academic knowledge and skills, while the programmatic emphasis on socializing had significant correlation with the students' ability to present their research, publish their research and be prepared for their future career.

The control variable, financial assistance in form of TA found to have significant correlation with participants' ability to acquire knowledge and academic skills. While RA alone had meaningful correlation with participants' satisfaction with their academic gains, the independant variable, scholarship alone had no significant correlation with any of the studied dependant variables. The financial assistance in form of TA combined with RA correlated with dependant variables, acquisition of knowledge and academic skills, presenting research, career preparation and overall satisfaction with academic gains. Also, financial assistance in form of TA combined with scholarship showed significant correlation only with international students' overall satisfaction with their academic gains. The scholarship combined with RA shown to have strong correlation with the variables acquisition of knowledge and academic skills and career preparation.

The overall model was significant for all eleven independent variables. Nevertheless, independent contributions of student engagement in academic and social activities varied for different academic gains. For example, active and collaborative learning, supportive campus environment, usage of technology, and programmatic emphasis on studying and socializing were significantly related to the students' acquisition of academic knowledge and skills in their doctoral area . The supportive campus environment was the only independent variable that was significantly related to the international doctoral students' ability to write clearly and effectively. The student participation in co-curricular activities, supportive campus environment, and time that they spent on academic work had a significant relationship with presenting and publishing research among the international doctoral students. In addition, active and collaborative learning and programmatic emphasis on socializing were significantly related to publishing research. Student-faculty interaction and a supportive campus environment were found to have a significant relationship with the career preparation of international students in doctoral programs. Overall, two types of student engagement–the supportive campus environment and participation in co-curricular activities—were percieved as key contributors to international doctoral students' satisfaction with their academic gains. Moreover, the financial assistance in the forms of TA, RA, and scholarships were also perceived as significant contributors to the academic gain and satisfaction of international doctoral students. Interestingly, degree from another U.S. college contibuted significantly to the participants' ability to write clearly and effectively. The financial assistance in forms of TA combined with scholarship, RA, and scholarships also perceived as significant contributor to the overall satisfaction of international students. In summary, the results indicated a definite correlation between international students' academic and social engagement and their academic achievement in doctoral study.

Table 28

Relationships of Engagement in Academic and Social Activities to Self-reported Academic Gains

	AKS	CEW	PR	PuR	CP	SAG
Research assistanship						+
Teaching assistantship						
Scholarship or grant	+					+
TA and RA						
RA and scholarship	+					+
TA and scholarship						+
Time in program			+			+
Attendance of another U.S. college		+				
Active & collaborative learning	+			+		
Student-faculty interaction					+	
Supportive campus environment	+	+	+	+	+	+
Participation in co-curricular activities			+	+		+
Participation in extra-curricular activities						
Attendance of various events						
Technology usage	-					
Time spent on academic work			+	+		
Working hard to meet instructors' course requirements						
Programmatic emphasis on studying	+					
Programmatic emphasis on socializing	-			+		

AKS- Acquisition of knowledge and skills; CEW – Clear and effective writing; PR – Presenting research; PuR – Publication of research; CP – Career preparation; SAG – Satisfaction with academic gains
+ indicates significant positive contribution at $p<0.05$
- indicates significant negative contribution at $p<0.05$

CHAPTER FIVE

DISCUSSION

This study aimed to examine the extent to which international doctoral students engage in academic and social activities and how the doctoral student engagement is related to their academic gains such as (1) the acquisition of academic knowledge and skills, (2) clear and effective writing, (3) presentation of research, (4) research publication, (5) career preparation, and (6) satisfaction with academic gains.

Conclusions from descriptive findings

The first question in this dissertation studied the extent of international doctoral student engagement in academic and social activities. As the results of the IDSES illustrate, the extent of the engagement was not the same across the different types of academic and social activities. The extent of engagement in the student-faculty interaction and the collaboration with advisors were among the variables with the lowest means in this study. The survey respondents rated their interaction with faculty as almost "never". Though the research by Green and Kim (2005) considers the student-faculty interaction crucial for high academic achievement among international doctoral students, less interaction with faculty can actually be the indicator of academic excellence and confidence in the domestic students' academic and research skills. It makes the interaction with faculty less necessary for the domestic students who succeed academically than for those who struggle with the coursework, research, and career plans.

From the social engagement perspectives, however, interaction with faculty at their academic programs can help international doctoral students to familiarize themselves with the system and culture of their academic department and thus support them in achieving their

academic goals. This in turn can benefit the academic departments and institutions with satisfactory results from their doctoral students (Poyrazli, 2006). It also should be beneficial for students who are pursuing their doctoral degree to interact with the faculty in their academic departments on the issues that are not extensively discussed in their classes such as career plans after graduation. Preparation for professional roles, job search, decision in career plans, and building professional networks are essential steps for the students' career preparation. International doctoral students need to learn these aspects of preparation for their career after completing their doctoral education, and interactions with faculty can be a valuable part of this.

In addition, this research found that the international doctoral students did not extensively engage in active and collaborative learning. A small percentage of the students (13.5%, n=57) reported that they asked questions in class or contributed to class discussions and worked actively with other students on projects during class or outside of class to prepare class assignments. This finding corresponds with the literature on international students in regards to their participation in class discussions and working on projects and assignments with their peers. According to the literature on international students, there can be several reasons for international students' passive participation in collaborative learning. When international students first start taking academic classes, they experience a number of concerns related to understanding classroom instruction, participating in classroom discussions, or figuring out the professor's expectations (Poyrazli, 2006). Students also tend to worry about achieving their academic goals in order to graduate. Usually students from more traditional cultures (e.g.,, Asian cultures) may feel distant to the American culture and experience more adjustment difficulties. Another factor, the level of perceived prejudice, can have an impact, for as it increases, so does the likelihood that international students will identify with other international students rather than

host nationals (Poyrazli, 2006). Also, the differences between the educational systems in the United States and the students' home countries serve as another reason of why the international students do not actively participate in class discussions (Moffett, 2006).

As a result of the reasons described above, the students, who have different educational experience and different educational system in their home countries, find that adjusting to the American classroom culture is a constant struggle throughout their doctoral education. These concerns indicate that the finding of this dissertation research is important for the academic departments to consider; they need to be aware that international students come from the countries where the educational system is significantly different from that of the United States. The faculty of the academic departments with international doctoral students should consider planning annual workshops where the professors are prepared on how to help international students in their classes make a successful transition from their home countries' educational style to the educational style of American classrooms. This support of international doctoral students can be beneficial for both the faculty and the students; it would provide an active means of integrating of international students in doctoral programs rather than expecting the international students to automatically blend in the American educational and learning styles.

Consequently, the activities on the part of the academic departments and universities are related to desired doctoral program outcomes and these activities are one of the two elements that engagement emphasizes (Wolf-Wendel et al., 2007). In the case of international doctoral students, this element of engagement is absolutely important because they face an unfamiliar culture and different educational and learning styles. They are surrounded by the language of limited comprehensibility, which leads them to face more stress than their American peers do (Huntley, 1993) and that is why they need departmental and institutional support during their

doctoral education. In addition, the departmental and institutional role is influential on doctoral student attrition (Golde, 2005). This study found that the departmental and institutional support in the forms of emphasizing the students' academic success was significantly related to their academic achievement. Furthermore, the quality of the relationships that the students had with their institutions' administrative personnel, faculty, staff, and other international students and American peers was found to significantly contribute to their academic gains. The relationship between the supportive campus environment and academic gains among the international doctoral students is discussed further in this chapter.

One of the main goals of this research was to analyze the extent to which the international students engaged in social activities during their doctoral education. This finding revealed that the international doctoral students at six research universities did not extensively engage in social or extra-curricular activities. This low ranking indicates the need to reconsider and improve this area by higher education professionals and institutions. Literature suggests that social engagement for doctoral students is very important, often being called as "a central component to understanding the life and experience of the graduate student" (Gardner, 2005). The quality of social life is important, especially for international doctoral students, because they lose their social support when they move to the United States. Poyrazli and Grahame (2007) point out that international students in U.S. higher education institutions face the challenges of making new friends, coping with the loss of social support, and developing a new social support system. Consequently, international students experience tension, confusion, and depression. As a result, the lack of social support leads to lower academic achievement (Poyrazli & Grahame, 2007). A study by Trice (2004) also found out that socializing with American students has a direct impact on the academic achievement of international graduate students. The impact of social networks

between international graduate students and American students is positive, which in turn leads to satisfaction with academic programs among international graduate students (Trice, 2004). Perhaps that is why the international doctoral students indicated the low level of academic satisfaction in this research. If they were actively engaged in extra-curricular activities, their satisfaction level might have been higher. For international students, social engagement is especially necessary even in the first phase of their doctoral education; this is a time when they arrive at their university, search for a place to live, report to their school about their arrival, do all paperwork associated with their arrival, set up a university e-mail account, and enroll in classes. Also, international doctoral students do not know about the institutional resources and opportunities to find on-campus job, and they welcome any advice given in this regards. A strong social network would provide support during the undertaking of this multitude of tasks.

Based on the regression analysis of the responses provided by the international doctoral students in six universities, the following section will discuss the findings of the research questions in this study.

Research Question 1: Relationship between engagement in academic and social activities and the acquisition of academic knowledge and skills

The results of the data presented by the IDSES revealed that a supportive campus environment, student engagement in active and collaborative learning, technology usage, and programmatic emphasis on studying and socializing were significantly related to the knowledge acquisition in the areas of doctoral study. When the academic departments interact with the students, engage them in academic experiences and emphasize activities for enriching the students' experiences, the doctoral students have greater engagement and learning (Ullah, 2007).

Another finding of the study was that the participants in this study did not extensively use technology during their doctoral education. Moreover, using technology (i.e., blackboard, Facebook, listserv) to discuss readings and ides from their classes with their peers was negatively related to the academic gains of the doctoral students. The reason for not using the technology extensively might be related to the preferred communication styles of the international students, which may differ from the communication styles of domestic students. It would be interesting to examine the extent of the technology usage among domestic doctoral students in order to see how extensively they use it to discuss readings with their classmates and compare the results with the population of the international doctoral students.

The other reason of the limited use of technology and its negative effects on academic achievement may be due to the fact that overall, international students do not have frequent communications with their domestic peers and classmates. While there is no existing literature on the effects of the technology usage on academic achievement of international doctoral students, a wide range of research was conducted on the other ways of communication between international students and their peers. Participation in co-curricular and extra-curricular activities and attendance of various events provides international students with the opportunities of communicating with their domestic peers. They are the forms of social engagement that integrate students with their college culture, and they are important on graduate level of study (Gardner, 2009). It is important to consider why international doctoral students need to socialize with people and how this is connected to their academic achievement. Trice (2004) connects it with the social capital theory and suggests that having social interactions helps international graduate students to learn about resources and opportunities at their institutions that can in turn foster their acquisition of knowledge in their doctoral area of study.

As international students try to settle into their new environment with the start of the semester, they may also feel academic stress similar to their domestic counterparts (Poyrazli, 2006). However, Poyrazli (2006) says that unlike the other students, international students usually do not have similar resources to combat this stress. This lack of resources, coupled with the previous stated psychological experiences, could lead to homesickness, depression, or anxiety (Poyrazli, 2006). This indicates why academic departments that offer doctoral degrees should realize that academic achievement is the highest priority for most international students who are likely to experience strong academic pressures.

While examining the academic achievement of international doctoral students, the dissertation investigated the correlation between financial support in the forms of teaching assistantships, research assistantships, scholarships, or grants and the academic achievement of international doctoral students. It was found that the students' acquisition of academic knowledge and skills was significantly correlated with having research or teaching assistantships. It is the belief of this researcher that students who work as teaching or research assistants tend to use campus resources often, attend on-campus activities, interact with the faculty, and socialize with the peers in their academic departments. The students who have research or teaching assistantships during their doctoral education also have the highest likelihood of degree completion compared to students with other forms of financial support (Ampaw, 2010).

Research Question 2: Relationship between engagement in academic and social activities and writing clearly and effectively

This study found two factors, the student attendance at another U.S. university and a supportive campus environment, to have a significant relationship with the international

students' development of the clear and effective writing skills. As mentioned in the previous paragraphs, international students come from different educational backgrounds, and consequently, they possess different styles of academic writing. The differences between the U.S. style of academic writing and the style of writing in other countries may affect academic writing among international doctoral students. Not being familiar with the culture and requirements of academic writing in the U.S. higher education institutions could cause international students to feel less confident about their ability of writing clearly and effectively. Also, limited language proficiency serves as an obstacle for international students in completing essay examinations and taking notes during lectures (Li, Fox & Almarza, 2007). One factor that this study showed has a positive effect on writing clearly and effectively is attendance at another higher education institution in the United States; it appears to provide international doctoral students with the experience and knowledge of the requirements for academic writing in the U.S. degree programs. Those students with previous college experience in the United States have better writing skills than those students who did not have a prior college attendance in the United States before starting their doctoral education.

In this study, the students did not show a high level of interaction with the faculty at their academic departments and it may serve as a factor for not developing the ability to write clearly and effectively and as a consequence, the students' rating of their writing level was indicated as slightly over average. I think that the interaction with faculty is important for international students in doctoral programs because clear and thorough feedback from the faculty guides students in the process of writing.

Research Question 3: Relationship between engagement in academic and social activities and presenting research among international doctoral students

The length of time that the survey respondents had spent in their doctoral programs, their engagement in co-curricular activities and amount of time they spent on academic work had significant relationships with their academic achievement in presenting research. The students reported their academic gains in presenting research as average to good. As the results of the data analysis suggest, engagement in co-curricular activities helped students to develop their academic skills in presenting research. I think that development of research presentation skills among international students highly depends on their engagement in the academic activities. The length of time that they survey respondents had spent in their doctoral programs matters in terms of gaining experience and skills in presenting research. It can also build academic confidence which is important for international doctoral students. Because by the end of their doctoral programs, the students are required to demonstrate that they can do independent research that advances the undeveloped areas of knowledge. In this matter, working with faculty in research enables doctoral students to better acquire an understanding of research techniques (Report by the Association of American Universities on Doctoral Education in the United States, 2011).

Research Question 4: Relationship between engagement in academic and social activities and publishing research among international doctoral students

The existing literature states that not many students have publications when they are still in doctoral programs, in fact not even while writing their dissertation. The study by Elsey (2007) finds that only 21% of doctoral students publish their research when it is in progress. However, about 51% of doctoral students do not publish their research work (Elsey, 2007). And this study

found that publishing a research can significantly be related to the student engagement in active and collaborative learning, participation in co-curricular activities, the amount of time spent on academic work. Interestingly, the data analysis revealed that the programmatic emphasis on socializing was significantly related to the students' academic gain in publishing their research too.

Even though doctoral students are not required to publish their research in progress, academic departments should encourage their doctoral students to have publications, as a number of positive outcomes for doctoral students and doctoral programs result from publishing research works. First, research publications indicate a solid application of doctoral knowledge (Elsey, 2007). Second, the process of preparing research work for publishing builds a close and productive relationship between a student and supervisor (Elsey, 2007). Third, publications indicate the academic performance of doctoral students (Elsey, 2007).

Research Question 5: Relationship between engagement in academic and social activities and career preparation among international doctoral students

The doctorate education is the foundation for an academic career (Elsey, 2007). For those who are already pursuing an academic career, doctorate education can serve to help diversify in a new subject area through the expertise gained in a specialized knowledge field; it can also serve provide the standing that will lead to an academic promotion (Elsey, 2007). The results of the IDSES showed that engagement in academic activities such as student-faculty interaction and a supportive campus environment was significantly related to career preparation among international doctoral students. Engagement in all the other academic and social activities did not have a significant relationship with the career preparation of the students.

Academic advisors play a significant role in enabling doctoral students to plan actively for the application of their learning after they officially complete their studies (Elsey, 2007). The national study by Golde and Dore (2001) provides data on the experiences of doctoral students through the Survey on Doctoral Education and Career Preparation that was conducted among 27 institutions and 1 cross-institutional program. The results from this study suggests that the training doctoral students receive is not what they want nor does it prepare them for jobs that they take (Golde & Dore, 2001).

Research Question 6: Relationship between engagement in academic and social activities and satisfaction with academic gains among international doctoral students

It was both interesting and frustrating to find out that international doctoral students who participated in this research project were not satisfied with their academic gains. Satisfaction with academic gains in their doctoral education had a very low mean, showing that the international doctoral students in six research universities were almost never satisfied with their doctoral experience. As this study found, the international doctoral students' satisfaction with their academic gains had a significant relationship with their participation in co-curricular activities and a supportive campus environment. A supportive campus environment, which is based in relationships with faculty, staff, and peers, is important for student satisfaction with academic experience and academic achievement. For doctoral students, the correct choice of an advisor can result in higher satisfaction in their degree programs (Gardner, 2008). In particular, international students who come from educational systems different from the United States educational system consider their academic advisors as their mentors, often turning to them first when they need an advice and support. For example, even after living in the United States for

nine years and having a master's degree from a U.S. university, I still contact my academic advisor to discuss any academic issues that I am uncertain about. I have had positive experiences working with professional and supportive academic advisors. However, the literature on doctoral international students and conversations with other international students in doctoral programs emphasize how frustrating it can be for many students who do not have this support and consequently feel lost, stressed, and depressed during their doctoral experience. Perhaps that is why international doctoral students in this study indicated that they were not satisfied with their academic achievement in their doctoral program. Related to this issue, the level of the student-faculty interaction reported in this study was low among the international doctoral students. It is reasonable to suggest that if it were higher, it would have made a difference in the level of the doctoral students' satisfaction with academic achievement.

Implications of study

The research on international students mainly focuses on issues such as culture shock, adjustment to the foreign country, different educational systems, language difficulties, and stress experienced during the students' academic and social life in the United States. The existing research does not extensively discuss international students in doctoral programs (Le & Gardner, 2010; Mehra & Bishop, 2007; Moffett, 2006). Therefore, the results of this dissertation make a contribution to literature on international students by studying two aspects of their doctoral education: engagement in academic and social activities and self-perceived academic gains in pursuing a doctoral degree.

The first implication of this study is that it calls for the attention of higher education professionals to help international doctoral students in engaging actively in academic and social

activities during their doctoral education. The results of the IDSES illustrated that there are several areas that need to be improved in order to provide international students with positive experience and satisfactory outcomes during their doctoral study in the United States. Providing a supportive campus environment for international doctoral students is beneficial in helping them achieve their academic goals and successfully complete their doctoral degree.

The second implication of this study is directly addressed to academic departments that have international students in their doctoral programs. The findings of this research revealed that international doctoral students rarely interact with the faculty in their academic departments and they are not satisfied with their academic gains. Student learning is in large part a function of the effort, frequency, and quality of interactions between students and university faculty, personnel, and staff within the campus environment (Lovitts, 2008). Many doctoral students do not understand what doctoral study is, how it works, and how to effectively pursue their degree (Golde & Dore, 2001). Doctoral students should be encouraged to actively interact with the faculty of the academic departments during their dissertation stage. This interaction during the third stage of the doctoral work can foster their academic gains in developing research skills and help them complete their degree successfully. According to literature, forty three percent of doctoral students never complete their degree, and most of the doctoral students leave their program at the stage of writing their doctoral dissertation (Lovitts, 2008). Academic departments should not ignore interaction with doctoral students because it has a direct impact on the students' retention.

The third implication of this study is related to the campus offices charged with coordinating services for international students. The results of the study should be taken under consideration by these offices in order to support international doctoral students in their

transition to the higher education in the United States and their integration to its society. Obviously, the ISSS offices have orientations, support services, and events for international students overall; however, they should initiate programs designed specifically to help international students in doctoral programs.

The fourth implication of the study is directed to university career services. The students in this study reported low indications of career preparation during their education in doctoral programs. The question on the career preparation was followed by the question on academic satisfaction. And the analysis of the results showed that the international doctoral students in this study were not satisfied with their academic gains. Perhaps low achievement in academic satisfaction is related to the students' low academic gain in career preparation. For those international students who continue their life in the United States, it is obviously important to find a job and have a successful career. Therefore, university career centers need to collaborate with academic departments within their university in order to organize workshops, seminars, and career fairs for the doctoral students.

Limitations

This dissertation studied international doctoral students in six research universities with similar characteristics in one region, the Midwest. However, this research did not compare the extent of the engagement in academic and social activities among international students according to their current universities. When it comes to the doctoral education, the discipline and department become the central focus of the successful doctoral experience rather than the larger institution, which is different from the undergraduate experience (Gardner, 2009). Further

research is needed to study the patterns of the student engagement according to the different universities.

The second limitation of this study is that it does not compare the outcomes of the student engagement according to the students' academic disciplines. It would be useful to conduct comparative research that can look at the international doctoral students' academic and social engagement and compare the results according to the different academic major or disciplines. This is because doctoral education is experienced differently within and among different disciplines and because disciplines have their own particular cultures, goals, qualities, values, distinctive features, and codes of conduct that influence students, faculty, and staff (Gardner, 2009).

The third limitation of this study is that it does not compare student engagement in social activities according to the international students' country of origin. In particular, patterns of social engagement might be different for the students from various countries of the world. For example, international students from Middle Eastern and African countries tend to interact and socialize with their American peers less often than the students from other regions of the world (Trice, 2004). The international students who look alike and are culturally similar to Americans generally interact with domestic students more often and are more active in social engagement than those who do not have similar characteristics with Americans. Further research is needed to study social engagement of international doctoral students according to their home countries. Studying international doctoral students' socialization patterns with Americans based on their countries of origin and recommending strategies for the academic programs to encourage their international doctoral students to interact with Americans would be helpful for the students' academic achievement in their doctoral study.

Future research directions

This dissertation examined the extent of student engagement in academic and social activities among international doctoral students and found significant relationships between student engagement and self-perceived academic gains. This research opens new perspectives for studying international students in the U.S. higher education institutions and suggests the following directions in future research on the population of the international students in doctoral programs:

- Examining the extent of student engagement among domestic doctoral students and compare the results with the international doctoral student engagement would be useful in investigating the different patterns of student engagement according to these two types of student population in doctoral programs.
- Results of the data for this dissertation explored that the extent of student-faculty interaction was low among the international doctoral students in six research universities. The area of student-faculty interaction should be studied further and reasons for low student-faculty interaction in doctoral programs need to be identified.
- This study did not investigate student engagement according to the academic disciplines of the students in doctoral programs. Further research on international doctoral student engagement in educational and social activities requires taking into consideration the academic disciplines of the students because the patterns of student engagement may vary based on the students' academic disciplines.
- Another direction for the future research would be to compare engagement in academic-social activities among international students in doctoral programs and undergraduate programs.

Conclusion

In this research, I investigated an unexplored area of research on international doctoral students in six research universities in the midwest region of the United States in order to examine and understand the students' level of engagement in academic and social activities. The second aim of this research was to assess the relationships between eleven scales of doctoral student engagement and six self-reported academic gains during doctoral education. The results of the International Doctoral Student Engagement Survey (IDSES) agreed with the literature that several issues are still not addressed in the research on international students in doctoral programs. Studying these issues can make significant contributions to the further development of doctoral education in the United States. The current research on the international students in U.S. higher education institutions focuses only on the issues of culture shock, language difficulties, and adjustment to the American style of life, cultural differences, depression, stress, and anxiety among international students. It partly discusses the effects of these issues on the academic achievement of the students. However, the current research does not specifically address the population of the international students in doctoral programs, and it often combines them with other graduate students who are in master's programs or who are pursuing professional degrees. Therefore, the purpose of this research was to study the population of the international students in doctoral programs and discuss their academic achievement from the angle of their engagement in academic and social activities, attempting to make a connection between the international students' academic gains during the doctoral education and their academic and social life. I used Kuh's (2003) theory of student engagement for this research, but as this theory focuses on the undergraduate student population in the United States, other research works that discuss doctoral students' engagement in co-curricular and extra-curricular activities were considered, as would

not be acceptable to merely apply Kuh's (2003) theory of engagement to the population of doctoral students. As a result, only some of the items from the National Survey of Student Engagement (NSSE) based on Kuh's theory of student engagement (2003) were employed for this study (with the permission from The College Student Report, National Survey of Student Engagement, Copyright 2001-10 The Trustees of Indiana University (Appendix B)). The selection of the particular questions from the NSSE was based on the support of the literature that discusses the issues of academic gains for the population of doctoral students. The formation of the other questions for the IDSES was based on the research works by Gardner (2009), Golde (2005), and other researchers.

The doctoral international students reported high level of programmatic emphasis on studying, moderate level of having a supportive campus environment, low level of engagement in active and collaborative learning, participation in co-curricular activities, and limited engagement in activities like student-faculty interaction, participation in extracurricular activities, attendance at various events, and the usage of technology. The self-reported academic gains (acquisition of academic knowledge and skils, clear and effective writing, presentation and publishing ability and career preparation) of international doctoral students at the participant universities were found to be in the range of *average* to *good*. While none of these gains were perceived by the participants as *excellent,* the participants reported rather low level of overall academic satisfation.

Overall, two types of student engagement – the supportive campus environment and participation in co-curricular activities – were percieved as key contributors to international doctoral students' satisfaction with their academic gains. The active and collaborative learning, supportive campus environment, usage of technology, and programmatic emphasis on studying

and socializing were significantly related to the students' acquisition of academic knowledge and skills in their doctoral area . The supportive campus environment was the only independent variable that was significantly related to the international doctoral students' ability to write clearly and effectively. The student participation in co-curricular activities, supportive campus environment, and time that they spent on academic work had a significant relationship with presenting and publishing research among the international doctoral students. In addition, active and collaborative learning and programmatic emphasis on socializing were significantly related to publishing research. Student-faculty interaction and a supportive campus environment were found to have a significant relationship with the career preparation of international students in doctoral programs. The financial assistance in forms of the research assistantship, scholarships and the teaching assistantship combined with scholarship, also were found to be significant contributors to the overall satisfaction of international students. Interestingly, degree from another U.S. college contibuted significantly to the participants' ability to write clearly and effectively.

In conclusion, this research indicated a definite relationship between international students' academic and social engagement and their academic achievement in doctoral study. Various key areas for improvement such as the emphasis on active and collaborative learning, student-faculty interactions and engagement in extra-curricular activities social engagement were identified. The key findings will be shared with the participant universities and I hope that these findings will be of significant benefit to the universities, faculty and international students in achieving academic excellence in dcotoral education and have positive social experience in the United States which is the ultimate goal of the American higher education institutions.

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Appendix A

KU RESEARCH & GRADUATE STUDIES
The University of Kansas

12/30/09
HSCL #18429

Zamira Akobirova
7107 Encampment Road
Lansdale, PA 19446

The Human Subjects Committee, Lawrence Campus (HSCL) has received your response to its expedited review of your research project

18429 Akobirova/Twombly (ELPS) The Relationship of Engagement in Academic-Social Activities to Academic Achievement Among International PhD Students in Four Research Universities

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Since your research presents no risk to participants and involves no procedures for which written consent is normally required outside of the research context HSCL may waive the requirement for a signed consent form (45 CFR 46.117 (c) (2). Your information statement meets HSCL requirements. The Office for Human Research Protections requires that your information statement must include the note of HSCL approval and expiration date, which has been entered on the form sent back to you with this approval.

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at http://www.rcr.ku.edu/hscl/hsp_tutorial/000.shtml.
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding which requests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Jan Butin
Associate Coordinator
Human Subjects Committee Lawrence

cc: Susan Twombly

Human Subjects Committee Lawrence
Youngberg Hall | 2385 Irving Hill Road | Lawrence KS 66045 | 785 864-7429 | Fax 785 864-5049 | www.rcr.ku.edu/hscl

Appendix B

National Survey
of Student Engagement

The College Student Report
Item Usage Agreement

The National Survey of Student Engagement's (NSSE) survey instrument, *The College Student Report*, is copyrighted and the copyright is owned by The Trustees of Indiana University. Any use of survey items contained within *The College Student Report* is prohibited without prior written permission from Indiana University. When fully executed, this Agreement constitutes written permission from the University, on behalf of NSSE, for the party named below to use an item or items from *The College Student Report* in accordance with the terms of this Agreement.

In consideration of the mutual promises below, the parties hereby agree as follows:

1) The University hereby grants **Zamira Akobirova** ("Licensee") a nonexclusive, worldwide, irrevocable license to use, reproduce, distribute, publicly display and perform, and create derivatives from, in all media now known or hereafter developed, the item(s) listed in the proposal attached as Exhibit A, solely for the purpose of including such item(s) in the survey activity described in Exhibit A, which is incorporated by reference into this Agreement. This license does not include any right to sublicense others. This license only covers the survey instrument, time frame, population, and other terms described in Exhibit A. Any different or repeated use of the item(s) shall require an additional license.

2) In exchange for the license granted in section 1, Licensee agrees:

   a) there will be no licensing fee to use NSSE items for the purposes described in Exhibit A;

   b) to provide to NSSE frequency distributions and means on the licensed item(s);

   c) on the survey form itself, and in all publications or presentations of data obtained through the licensed item(s), to include the following citation: "Items *xx* and *xx* used with permission from *The College Student Report,* National Survey of Student Engagement, Copyright 2001-10 The Trustees of Indiana University";

   d) to provide to NSSE a copy of any derivatives of, or alterations to, the item(s) that Licensee makes for the purpose of Licensee's survey ("modified items"), for NSSE's own nonprofit, educational purposes, which shall include the use of the modified items in *The College Student Report* or any other survey instruments, reports, or other educational or professional materials that NSSE may develop or use in the future. Licensee hereby grants the University a nonexclusive, worldwide, irrevocable, royalty-free license to use, reproduce, distribute, create derivatives from, and publicly display and perform the modified items, in any media now known or hereafter developed; and

   e) to provide to NSSE, for its own nonprofit, educational purposes, a copy of all reports, presentations, analyses, or other materials in which the item(s) licensed under this

Indiana University Center for Postsecondary Research
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National Survey
of Student Engagement

Agreement, or modified items, and any responses to licensed or modified items, are presented, discussed, or analyzed. NSSE shall not make public any data it obtains under this subsection in a manner that identifies specific institutions or individuals, except with the consent of the Licensee.

3) This Agreement expires on October 31, 2010.

The undersigned hereby consent to the terms of this Agreement and confirm that they have all necessary authority to enter into this Agreement.

For The Trustees of Indiana University:

Alex McCormick — 10/13/2009

Alexander C. McCormick
Director
National Survey of Student Engagement

Date

For Licensee:

AZ — 10/20/2009

Zamira Akobirova
Graduate student
University of Kansas

Date

Susan Twombly
Professor and Chair
University of Kansas

Date

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Information Statement

The Department of Educational Leadership & Policy Studies at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty.

We are conducting this study to better understand the extent to which international doctoral students engage in academic and social activities and the possible effects of student engagement on students' academic gains. This will entail your completion of the survey. The survey is expected to take approximately 5-7 minutes to complete.

The content of the survey should cause no more discomfort than you would experience in your everyday life. Although participation may not benefit you directly, we believe that the information obtained from this study will help us gain a better understanding of student engagement and academic success among international doctoral students. Your participation is solicited, although strictly voluntary. Your name will not be associated in any way with the research findings. It is possible, however, with internet communications, that through intent or accident someone other than the intended recipient may see your response.

If you would like additional information concerning this study before or after it is completed, please feel free to contact us by phone or mail.

Completion of the survey indicates your willingness to participate in this project and that you are over the age of eighteen. If you have any additional questions about your rights as a research participant, you may call (785) 864-7429 or (785) 864-7385 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 12/30/2009. HSCL #18429

Sincerely,

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Appendix C

Survey on international PhD student engagement[1]

1. On average, how many <u>hours a week</u> do you spend doing academic work (studying, reading, writing, doing lab work, analyzing data, and other academic activities)? LAC

2. While you were taking courses in the current doctoral program, how often have you worked harder than you expected to meet a course instructor's standards and expectations? LAC

Never	Sometimes	Often	Very often

3. **To what extent does your academic program emphasize each of the following?**

LAC, SCE, SCE, SE

	Very little	Little	Some	Very much
Spending significant amounts of time studying and doing academic work				
Socializing with international and American students				
Providing the support you need to help you succeed academically				
Providing the support you need to socialize with people				

[1] Items LAC, ACL, SFI, EEE and SCE used with permission from The College Student Report, National Survey of Student Engagement, Copyright 2001-10 The Trustees of Indiana University

4. During your study in the current doctoral program, how often have you done each of the following?

ACL, ACL, ACL, EEE, SFI, SFI, SFI, SFI, SFI, EEE, SE, SE

	Never	Sometimes	Often	Very often
Asked questions in class or contributed to class discussions.				
Worked actively with other students on projects during class.				
Worked with classmates outside of class to prepare class assignments.				
Used technology (blackboard, listserv, facebook) to discuss ideas from your readings or classes with others outside of class (peers, family members, etc.).				
Discussed grades or assignments with a course instructor.				
Discussed ideas from your readings or classes with faculty members outside of class.				
Talked about career plans with a faculty member or advisor.				
Worked with faculty members on activities other than coursework (committee, orientation, student life activities, etc.).				
Worked on a research project with a faculty member outside of course or program requirements.				
Participated in co-curricular activities which are related to your academic program (teaching/research assistantship,				

academic organizations, campus publications, etc.)				
Participated in extra-curricular activities which are not related to your academic program (campus groups, clubs, organizations, programs, etc)				
Attended an art, exhibit, dance, music, theater, or other performance				

5. Rate the quality of your social relationships at your university. SCE

	Poor	Average	Good	Excellent
Relationships with other international students.				
Relationships with American students.				
Relationships with faculty members.				
Relationships with administrative personnel and staff.				

6. Compared to the time when you first enrolled in the current institution, how would you rate your academic gains in the following areas?

	Poor	Average	Good	Excellent
Acquiring knowledge in your area of				

doctoral study				
Thinking critically and analytically				
Learning effectively on your own				
Writing clearly and effectively				
Presenting your research at conferences, seminars and workshops				
Publishing your research in scholarly journals				
Career preparation (preparation for professional role, job search, decision in career plans)				

7. To what extent, are you satisfied with your academic gains in current institution?

- ❑ Not satisfied
- ❑ Somewhat satisfied
- ❑ Satisfied
- ❑ Very satisfied

Demographic Information

1. Select the university at which you are currently enrolled.

- ❑ K-State University
- ❑ University of Kansas
- ❑ University of Missouri
- ❑ University of Missouri – Kansas City

2. What doctoral degree program are you currently enrolled in?

- ❑ PhD
- ❑ EdD/ or other types of doctoral degrees

3. What stage of doctoral program are you in now?

- ❑ I am taking courses;
- ❑ I have finished all coursework requirements. I am preparing for comprehensive exams and other requirements to meet additional requirement before dissertation;
- ❑ I passed my written and oral comprehensive exams and am writing my doctoral dissertation.

4. How long have you been in your current program?

5. Select the financial support you have been provided for your doctoral degree from your current university (check all that apply).

- ❑ Teaching assistantship
- ❑ Research assistantship
- ❑ Scholarship or grant
- ❑ I have not been provided any financial support

6. Do you have any other academic degree from your current university?

- ❑ Yes
- ❑ No

7. Did you attend another U.S. college or university before coming to your current university?

- ❑ Yes
- ❑ No

8. What is your country of origin?

LAC --- Level of Academic Challenge, NSSE items
ACL – Active and Collaborative Learning, NSSE items
SFI – Student-Faculty Interaction, NSSE items
EEE – Enriching Educational Experiences, NSSE items
SCE – Supportive Campus Environment, NSSE items
SE – Social Engagement

Appendix D

Frequencies and Percentages for Active and Collaborative Learning

	Frequency	Valid Percent
0.00	2	0.5
0.33	5	1.2
0.50	2	0.5
0.67	23	5.4
1.00	87	20.6
1.33	77	18.2
1.50	7	1.7
1.67	102	24.1
2.00	61	14.4
2.33	28	6.6
2.50	5	1.2
2.67	10	2.4
3.00	14	3.3
Total	427	

Appendix E

Frequencies and Percentages for Student- Faculty Interaction

Scores	Frequency	Percentage %
0.00	8	1.9
0.20	22	5.2
0.25	1	0.2
0.40	24	5.7
0.60	23	5.5
0.67	2	0.5
0.75	5	1.2
0.80	34	8.1
1.00	68	16.2
1.20	48	11.4
1.25	8	1.9
1.33	6	1.4
1.40	47	11.2
1.50	10	2.4
1.60	35	8.3
1.67	3	0.7
1.75	4	1.0
1.80	27	6.4
2.00	27	6.4
2.20	8	1.9
2.25	1	0.2
2.33	1	0.2
2.40	1	0.2
2.50	1	0.2

2.60	2	0.5
3.00	5	1.2
Total	423	100.0
Missing	4	
Total	427	

Appendix F

Frequencies and Percentages for Supportive Campus Environment

Scores	Frequency	Percentage %
1.00	1	0.2
1.17	1	0.2
1.33	3	0.7
1.50	7	1.7
1.67	15	3.5
1.75	1	0.2
1.80	1	0.2
1.83	20	4.7
2.00	39	9.2
2.17	30	7.1
2.20	6	1.4
2.25	1	0.2
2.33	53	12.5
2.40	5	1.2
2.50	54	12.8
2.67	48	11.3
2.80	3	0.7
2.83	47	11.1
3.00	40	9.5
3.17	15	3.5
3.20	1	0.2
.33	13	3.1
3.50	8	1.9

3.67	4	0.9
3.83	4	0.9
4.00	3	0.7
Total	423	100.0
Missing	4	
Total	427	

Appendix G

Frequencies and Percentages for Time Spent on Academic Work

Time in hours	Frequency	Percentage %
3	1	0.2
4	2	0.5
5	4	0.9
6	2	0.5
7	1	0.2
8	10	2.4
9	1	0.2
10	7	1.7
11	2	0.5
12	2	0.5
13	3	0.7
14	6	1.4
15	1	0.2
16	1	0.2
17	1	0.2
18	16	3.8
20	1	0.2
23	2	0.5
24	7	1.7
25	2	0.5
28	1	0.2
29	31	7.3
30	1	0.2
32	1	0.2

33	18	4.3
35	1	0.2
36	1	0.2
37	1	0.2
38	71	16.8
40	1	0.2
41	2	0.5
42	1	0.2
43	13	3.1
45	2	0.5
47	1	0.2
48	62	14.7
50	3	0.7
52	7	1.7
55	7	1.7
56	2	0.5
58	1	0.2
59	41	9.7
60	1	0.2
63	6	1.4
65	31	7.3
70	1	0.2
72	5	1.2
75	1	0.2
78	13	3.1
80	7	1.7
84	1	0.2

85	2	0.5
90	1	0.2
95	5	1.2
100	2	0.5
105	2	0.5
110	1	0.2
112	1	0.2
115	1	0.2
120	1	0.2
130	1	0.2
Total	423	100.0
Missing	4	
Total	427	